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THE PATERSON PUBLIC SCHOOLS

A SURVEY OF

SCHOOL FINANCES
SCHOOL BUILDINGS
AND
ACHIEVEMENTS OF PUPILS

BY

The Department of Educational Administration
Teachers College, Columbia University
New York City

1918

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REPORT OF SURVEY

Paterson Public Schools.

Paterson, New Jersey.

Under the Direction of

George D, Strayer, Professor of Educational Administration, Teachers College, Columbia University.

N. L. Engelhardt, Associate in Educational Administration, Teachers College, Columbia University.

F. W. Hart, Associate in Educational Administration, Teachers College, Columbia University.

E. S. Evenden, Assistant in the Department of Educational Administration, Teachers College, Columbia University.

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Paterson, N. J., October 10, 1918.

To the President and Members of the
Board of Education.

Gentlemen:—

I present herewith the report of the Survey of the public schools of Paterson made last Spring under the direction of Dr. George D. Strayer of Teachers College, Columbia University. The Survey includes a study of the school finances in Paterson with financial conditions of school districts elsewhere, an analysis of the growth and population of the city and their influence in a constructive school program and a very frank discussion of classroom work in the so-called fundamental subjects.

The report contains about two hundred pages of typewriting. I recommend that it be printed as part of the annual report for last year.

Respectfully submitted,
JOHN R. WILSON,
Superintendent of Schools.

THE PATERSON SCHOOL SURVEY.

In compliance with the request of the Board of Education and the Superintendent of Schools of Paterson, New Jersey, the Paterson School Survey was made in the spring of 1918 under the supervision of Dr. George D. Strayer, Professor of Educational Administration in Teachers College, and the rest of the staff of the department of Educational Administration in Teachers College. The staff included N. L. Engelhardt, Associate in Educational Administration, F. W. Hart, Associate in Educational Administration, and E. S. Evenden, Assistant in the Department.

The funds available for the survey did not permit of a complete study of the entire school system. The survey includes four major studies: first, the ability of Paterson to pay for educational advantages; second, the school building plant of Paterson; third, the achievement of pupils in the Paterson elementary schools; and fourth, the teaching staff and the quality of instruction. The first three of these studies are printed in this report.

The survey was carried on in connection with the Practicum in Educational Administration given in Teachers College. All members of this Practicum participated in the collection of data, the giving of tests, the measurement of buildings, and the final tabulations and summaries of the work actually done. Upon Dr. Strayer and his staff fell the responsibility for the direction and guidance of the students in all branches of their work and for the final form which the survey has taken.

The directors of the survey and members of the survey staff unite in expressing to Superintendent John R. Wilson and the members of his faculty their appreciation for their loyal cooperation and assistance while the survey was being made.

THE POPULATION OF THE CITY OF PATERSON

Any study of the educational problems and achievements of a city must, of necessity, be made with a basal knowledge of population growth and population composition. Paterson today is a city of 137,000 people.* That Paterson is a growing city is shown by Table I.

During the decade of 1890-1900 it increased in population 34%. This is one per cent. greater than the median growth for all cities in the United States. During the succeeding decade it increased 19%, which is an apparent falling off of 15%, and is 13% less than the median increase for all cities for the same period. This increase is more apparent than real, due to an interesting situation. The area of Paterson is less than nine square miles. In 1890 there were a few over 9,000 people to the square mile; in 1900 there were over 12,000; in 1910 about 15,000; and in 1916 somewhat over 16,000. This is one of the densely populated areas of the country, and has evidently been rapidly approaching a population limit under existing housing conditions and standards of living. During the last few years adjacent towns—towns which from many standpoints should be considered as parts of the city

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*Financial Statistics of Cities, 1916, p. 16.

TABLE I

POPULATION AND ITS INCREASE FOR A SELECTED LIST OF CITIES.

Selected Cities	Population 1910	Percentage of Increase 1890-1900	1900-1910
1 Schenectady	72,826	59	130%
2 Youngstown	79,066	35	76
3 Yonkers	79,803	50	67
4 Waterbury	73,141	60	60
5 New Bedford	96,652	53	55
6 Columbus	181,511	42	45
7 Bridgeport	102,054	45	44
8 Springfield	88,926	41	43
9 Elizabeth	73,409	38	41
10 Lawrence	85,892	40	37
11 Dayton	116,577	39	37
12 Trenton	96,815	28	32
13 Utica	74,419	28	32
14 Lynn	89,336	23	30
15 Grand Rapids	112,571	45	29
16 Toledo	168,497	62	28
17 Scranton	129,867	36	27
18 Troy	76,813	0.5	27
19 Syracuse	137,249	23	27
20 Somerville	77,236	54	25
21 Camden	94,538	30	25
22 Hartford	98,915	50	24
23 New Haven	133,605	33	24
24 Worcester	145,986	40	23
25 Manchester	70,063	29	23
26 Reading	96,071	35	22
27 Paterson	125,600	34	19
28 Hoboken	70,324	36	19
29 Wilmington	87,411	25	14
30 Cambridge	104,839	31	14
31 Fall River	119,295	41	14
32 Lowell	106,294	22	12
33 Albany	100,253	0.8	7
Median for all cities of the United States		33	32

of Paterson—have had a rapid development. Transportation facilities have made it possible for people who live just outside of the city to maintain their business interests within the city itself. This condition has probably had its effect upon the rate of city growth, and the apparent decline should not be taken too seriously. The situation, however, should be kept in mind in considering social conditions and in making educational recommendations.

TABLE II

RANK OF PATERSON IN THE OWNERSHIP OF HOMES

Rank	City	Per Cent of Homes Owned.
1	Grand Rapids	47
2	Toledo	43
3	Reading	39
4	Youngstown	39
5	Scranton	37
6	Dayton	37
7	Columbus	35
8	Utica	34
9	Schenectady	33
10	Syracuse	31
11	Trenton	31
12	Wilmington	30
13	Elizabeth	30
14	Springfield	29
15	Camden	28
16	Lynn	27
17	Somerville	27
18	Albany	26
19	New Bedford	25
20	New Haven	25
21	Worcester	24
22	Troy	24
23	Waterbury	23
24	Manchester	23
25	Paterson	23
26	Hoboken	23
27	Yonkers	23
28	Lowell	22
29	Bridgeport	22
30	Hartford	21
31	Lawrence	20
32	Fall River	17
33	Cambridge	17

The consideration of the size and rate of growth of the city of Paterson leads naturally to the subject of home conditions. From Table II it is seen that in the city of Grand Rapids, Michigan, 47% of the people own their homes, while only 17% of those in Cambridge, Massachusetts, own theirs. Paterson stands 25th, with a percentage rate of 23, in the list, of which these are the two extremes.

TABLE III

THE RANK OF PATERSON CONSIDERED FROM THE STANDPOINT OF NUMBER OF PERSONS TO A DWELLING.

Rank	City	Number to Dwelling.
1	**Dayton**	**4.4**
2	**Columbus**	**4.6**
3	**Reading**	**4.6**
4	**Toledo**	**4.7**
5	**Camden**	**4.7**
6	**Wilmington**	**4.7**
7	**Grand Rapids**	**4.8**
8	**Trenton**	**5.4**
9	**Youngstown**	**5.5**
10	**Syracuse**	**5.9**
11	**Scranton**	**5.9**
12	**Somerville**	**6.4**
13	**Albany**	**6.5**
14	**Springfield**	**6.7**
15	**Bridgeport**	**6.8**
16	**Lynn**	**6.8**
17	**Schenectady**	**6.8**
18	**Troy**	**7.1**
19	**Lowell**	**7.1**
20	**Cambridge**	**7.2**
21	**Utica**	**7.2**
22	**Elizabeth**	**7.3**
23	**New Haven**	**7.6**
24	**Paterson**	**7.9**
25	**Manchester**	**8.1**
26	**Lawrence**	**8.2**
27	**New Bedford**	**8.4**
28	**Hartford**	**8.6**
29	**Waterbury**	**9.5**
30	**Worcester**	**9.7**
31	**Yonkers**	**10.2**
32	**Fall River**	**10.9**
33	**Hoboken**	**15.9**

From Table III it may be noted that Paterson has 7.9 persons to a dwelling, and in this respect ranks 24th. Schenectady, which stands at the median in the number of persons to a dwelling, has 6.8, or one less than Paterson. It would seem that cities ranking below Schenectady in Table III and Somerville in Table II should look into their home and living conditions and, if possible, undertake to check certain evident tendencies. In this same connection Table X shows that in

TABLE IV.

RANK OF PATERSON IN PERCENTAGE OF NATIVE WHITE OF NATIVE PARENTAGE.

	Selected Cities	Percentage of Native White of Native Parentage.
1	Reading	78
2	Columbus	64
3	Dayton	62
4	Camden	52
5	Wilmington	51
6	Toledo	45
7	Albany	44
8	Syracuse	43
9	Schenectady	43
10	Troy	42
11	Trenton	40
12	Springfield	40
13	Somerville	38
14	Lynn	37
15	Grand Rapids	36
16	Utica	35
17	Youngstown	32
18	Hartford	31
19	Scranton	30
20	Worcester	28
21	Elizabeth	28
22	New Haven	28
23	Yonkers	27
24	Bridgeport	27
25	Waterbury	25
26	Cambridge	24
27	Manchester	23
28	Paterson	23
29	Hoboken	19
30	New Bedford	19
31	Lowell	19
32	Lawrence	14
33	Fall River	13

all probability these living conditions affect, for good or evil, large numbers of children.

The war has forced upon our attention certain serious questions in regard to the extent of the Americanization of our foreign population. It is certain that the temper of the American people will not consent to practices of the past which have resulted in attracting large numbers of foreigners to our country and in allowing them to retain their old world habits of thought and action with little real demand that they become fully Americanized. If this be true, one of the

TABLE V.

COMPARATIVE SUMMARY OF ELEMENTS IN THE POPULATION OF PATERSON, N. J.

Native White with Native Parentage	28,392	23%
Mixed Parentage	13,022	10
Negro, Japanese, Chinese, etc.	1,631	1
Foreign Influence	82.556	65

TABLE VI.

NATIONALITIES REPRESENTED AND EXTENT OF FOREIGN INFLUENCE IN THE POPULATION OF THE CITY OF PATERSON. (1910)

Country	No. of Foreign born in each Country.	No. of Native born with both parents born in country indicated.	Total Foreign Influence.	Percent.
Italy	9,317	5.161	14.478	12
Russia	6,861	3,334	10.195	8
Germany	5,741	5.161	10.902	9
England	5,271	3.510	8,781	6
Ireland	4,971	6,798	11,769	9
Holland	4,929	4,625	9.554	8
Scotland	2,468	1,650	4,118	3
Switzerland	1,466	832	2.298	2
Austria	883	419	1.302	1
Miscellaneous (12 or more countries)	3,491	5.667	9,158	7
Totals	45,398	37.157	22.555	65

first things to be considered in the study of a school district is the nativity of its population. Tables IV, V, and VI provide a basis for study of this important question.

From these data the following facts stand out: Only 23% of the population of Paterson is native white with native parentage. In this respect Paterson ranks 28th, being only five places from Fall River, which stands at the bottom of the list. The foreign born and the

TABLE VII.

RANK OF PATERSON ARRANGED AS TO PERCENTAGE OF WAGE EARNERS IN ONE INDUSTRY.

	City	Percentage of Wage Earners in one Industry
1	Schenectady	2.0
2	Elizabeth	8.0
3	Hoboken	10.0
4	Yonkers	11.0
5	Springfield	14.0
6	Syracuse	14.0
7	Cambridge	15.0
8	Toledo	16.0
9	Dayton	17.0
10	Albany	17.0
11	Reading	17.0
12	Hartford	18.0
13	Columbus	18.0
14	Camden	20.0
15	Bridgeport	20.0
16	Wilmington	20.0
17	Manchester	21.0
18	New Haven	21.0
19	Worcester	22.0
20	Trenton	26.0
21	Scranton	27.0
22	Utica	32.0
23	Grand Rapids	39.0
24	Lowell	41.0
25	Somerville	43.0
26	Waterbury	46.0
27	Troy	47.0
28	Paterson	57.0
29	Lynn	58.0
30	Youngstown	60.0
31	Lawrence	65.0
32	Fall River	81.0
33	New Bedford	82.0

children of those parents both of whom were foreign born, comprise what may be termed the foreign influence. These amount to 65% of the total population. The question arises, Is it wise for any limited area like Paterson to try to assimilate such a large body of non-American elements? Were these more equally scattered throughout our whole population the question might not be so serious.

TABLE VIII.

NUMBER OF PEOPLE EMPLOYED IN THE VARIOUS OCCUPATIONS IN PATERSON.*

(AGE: 10 years or over.)

Occupations	Males	Females
Manufacturing and Mechanical Industries	26,278	10,808
Trade	5,309	987
Clerical	2,638	1,149
Transportation	2,584	59
Domestic and Personal Service	1,925	2,420
Professional Service	1,383	952
Public Service	669	1
Agriculture, Forestry, Animal Husbandry	189	5
Extraction of Minerals	41	0
	41,016	16,381

*13th Census Vol. IV Page 181.

TABLE IX.

NUMBER OF PEOPLE EMPLOYED IN VARIOUS PATERSON INDUSTRIES.*

Industries	Number (1909) Totals	Under 16 years Males	Under 16 years Females
Silk Industry	20,099	249	338
Dyeing and Finishing Textiles	3,858	13	2
Foundry & Machine Shop Goods	3,530	29	8
Cordage, Twine, Jute, Linen	2,007	114	93
Men's Clothing and Shirts	1,985	35	48
Bread & Other Bakery Products	572	5	1
Printing and Publishing	425	19	10
Cotton Goods	272	9	21
Tobacco	208	6	0
Lumber and Lumber Products	193	2	0
Slaughtering and Packing	166	0	0
All Other Industries	2,801	27	9
	32,863	508	530

13th Census Vol. IX Page 782.

Tables VII, VIII and IX would seem to indicate that Paterson is a city of one industry. Fifty-seven per cent. of the wage earners are engaged in the manufacture of silk. Moreover, if certain allied industries, as dyeing and finishing textiles, are included the rate increases to more than 70%. Paterson has long been known as "The Silk City of the United States."

Tables X and XI show that Paterson ranks high in the number of children of compulsory school age and also in illiteracy. These tables are given merely to call attention to the tendencies resulting from the large

TABLE X.

RANK OF PATERSON AND THIRTY-TWO OTHER CITIES IN RESPECT TO PERCENTAGE OF TOTAL POPULATION INCLUDED IN THE 5-14 AGE GROUP.*

City	No.	Ages
Columbus	1	14.8
Albany	2	14.9
Lynn	3	15.0
Dayton	4	15.4
Syracuse	5	15.6
Troy	6	15.6
Springfield	7	15.9
Utica	8	16.2
Youngstown	9	16.5
Schenectady	10	16.6
Hartford	11	16.7
Somerville	12	16.7
Bridgeport	13	16.8
Wilmington	14	16.9
Grand Rapids	15	17.0
Lowell	16	17.0
Worcester	17	17.1
Toledo	18	17.2
Reading	19	17.2
Trenton	20	17.4
Lawrence	21	17.4
Cambridge	22	17.5
New Bedford	23	17.8
Camden	24	17.9
New Haven	25	18.1
Manchester	26	18.1
Waterbury	27	18.7
Elizabeth	28	18.8
Yonkers	29	18.8
Hoboken	30	19.1
Paterson	31	19.1
Scranton	32	20.2
Fall River	33	20.4

*Report of the U. S. Commission of Education, 1917.

foreign influence which need to be considered in programs for educational improvement.

Briefly summarizing: Paterson is a growing, densely populated city, largely dependent upon one industry —an industry using large numbers of unskilled men, women, and children. It is a city of rented homes, with a tendency to overcrowding in those homes. It is a city filled with a wage-earning, foreign class, many of whom are as yet unassimilated into American life.

TABLE XI.

RANK OF PATERSON IN ILLITERACY.*

	City	Percentage
1	Somerville	1.9
2	Troy	2.0
3	Dayton	2.3
4	Grand Rapids	2.5
5	Toledo	2.8
6	Cambridge	3.0
7	Reading	3.0
8	Lynn	3.0
9	Albany	3.2
10	Camden	4.4
11	Hoboken	4.5
12	Springfield	4.5
13	Columbus	4.6
14	Syracuse	4.9
15	Worcester	5.0
16	Bridgeport	5.4
17	Hartford	5.4
18	Schenectady	5.4
19	Manchester	5.9
20	Trenton	5.9
21	Lowell	6.0
22	Waterbury	6.2
23	Wilmington	6.6
24	Paterson	6.9
25	Elizabeth	6.9
26	New Haven	7.0
27	Youngstown	7.1
28	Utica	8.2
29	Yonkers	8.4
30	Scranton	8.9
31	Lowell	19.0
32	Lawrence	14.0
33	Fall River	13.0

Thirteenth Census, U. S. 1910

It has a relatively large school population which needs the best possible kind of education in fitting it for American industry and institutions. Paterson has a large task in providing a proper educational system to meet the heavy responsibility placed upon it because of its industrial make-up and predominating foreign influence.

THE ABILITY OF PATERSON TO FURNISH FUNDS FOR THE ADVANCEMENT OF EDUCATION WITHIN ITS BORDERS.

As education is at present administered in the United States, the educational opportunities offered to the children of any city are in large measure limited to the ability of that community to pay the price that such opportunities demand. All recommendations of the survey committees have been made with acknowledgment of the financial difficulties involved, as well as in the light of past and possible expenditures for educational purposes in Paterson and other cities of the United States. The measure of a community's attitude toward education is perhaps best expressed in terms of financial comparisons with other communities which have had approximately the same responsibilities. It is recognized in such comparisons that a low ranking may not always indicate niggardliness nor disregard for community needs. Such ranking may indicate that achievement and economy have gone hand in hand. The record of achievements in the Paterson schools, as measured by the survey committee, appears elsewhere. That Paterson's expenditures for school purposes rank low as compared with other cities is evident in the tables that follow.

Comparisons with other cities were made on two bases. For detailed statements of comparisons with Paterson a group of 33 cities was selected. The cities chosen are the cities north of the Mason-Dixon line and the Ohio River and east of the Mississippi River, which in 1910 had a population of 70,000 to 200,000, inclusive. Paterson with a population of 125,000 ranks seventh in population in the group selected. It was deemed more equitable to locate Paterson centrally in respect to the population of the cities selected, rather than to make her the median city of twenty-five cities with respect to rank. The latter method would involve cities whose population was over 200,000, some of which would have a population twice as great as Paterson.

As a more comprehensive study significant Paterson financial data covering a period of years have been compared with similar data from the median of all American cities above 30,000 in population. The cities falling into the first group with their population according to the 1910 census are Columbus, O., 181,511; Toledo, O., 168,497; Worcester, Mass., 145,986; Syracuse, N. Y., 137,249; New Haven, Conn., 133,605; Scranton, Pa., 129,867; Paterson, N. J., 125,600; Fall

River, Mass., 119,295; Dayton, O., 116,577; Grand Rapids, Mich., 112,571; Lowell, Mass., 106,294; Cambridge, Mass., 104,839; Bridgeport, Conn., 102,054; Albany, N. Y., 100,253; Hartford, Conn., 98,915; Trenton, N. J.,96,815; New Bedford, Mass., 96,652; Reading, Pa., 96,071; Camden, N. J., 94,538; Lynn, Mass., 89,336; Springfield, Mass., 88,926; Wilmington, Del., 87,411; Lawrence, Mass., 85,892; Yonkers, N. Y., 79,803; Youngstown, O., 79,066; Somerville, Mass., 77,236; Troy, N. Y., 76,813; Utica, N. Y., 74,419; Elizabeth, N. J., 73,409; Waterbury, Conn., 73,141; Schenectady, N. Y., 72, 826; Hoboken, N. J., 70,324; Manchester, N. H., 70,063.

Real wealth per capita may be regarded as the first item on which comparisons should be made.

In Table XII may be found the total value of property for the selected list of cities, the per capita true valuation, and the tax levy per $1,000 of true valuation, together with the rankings of the cities on each of the three bases. The data shown are for the year 1916. The total assessed valuation, and the ratio between assessed and real property values as given in the Financial Statistics for Cities for 1916, were utilized in securing the total true valuation figures. Paterson ranks seventh in population, fifteenth in total true valuation, and seventeenth on the basis of the tax levy per $1,000 of true property valuation. Paterson is below the median city of the group on the basis of each unit represented in Table XII, and is found in the fourth quartile on the basis of per capita true valuation. As compared on this last item with all cities above 30,000* Paterson ranks among the lowest thirty cities out of a total of two hundred and thirteen. In other words, the great majority of the larger cities in the United States have available per capita more property under the present system of taxation for the support of education than has the city of Paterson.

The tax levy per $1,000 of real property values shows that for 1916 Paterson failed to tax at a rate as high as that of sixteen other cities in the list.

The figures for one year may be regarded as dependent upon too many chance influences to be accepted without supporting evidence. Table XIII, which presents identical data for seven years of the period 1909-1916, shows that the 1916 rank is far better than that of any of the other six years. In other words, the maximum taxing privilege has not been reached in Paterson as measured by what the majority of the selected group of cities has found it possible to accomplish. Paterson's rank in the group of thirty-three cities has been 23rd, 27th, 25th, 26th, 30th, 25th, and 17th for the years 1909, 1910, 1911, 1912, 1913, 1915, and 1916 respectively.

Paterson's relative position as compared with all cities above 30,000 may be seen in Table XIV. The

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*See tables in A School Building Program for Cities, N. L. Engelhardt, Ph. D., Bureau of Publications, Teachers College, Columbia University, New York City.

TABLE XII.

WEALTH AND TAX RATE OF PATERSON COMPARED WITH 32 OTHER CITIES.*

Name of City	Rank in Population	Total True Valuation	Rank	True Value Per Capita	Rank	Levy per $1000 True Valuation	Rank
Columbus, Ohio	1	$282,151,320	1	$1345	6	$13.60	2
Toledo, Ohio	2	268,710,280	2	1430	4	15.16	5
Worcester, Mass.	3	180,061,080	5	1117	12	20.40	16
Syracuse, N. Y.	4	154,806,784	11	926	18	27.77	29
New Haven, Conn.	5	161,750,542	9	1058	13	22.23	23
Scranton, Pa.	6	105,224,770	18	730	31	17.88	8
PATERSON, N. J.	7	111,406,369	15	786	26	20.43	17
Fall River, Mass.	8	107,153,345	17	833	23	23.00	26
Dayton, Ohio	9	171,481,890	6	1366	5	13.40	1
Grand Rapids, Mich.	10	163,026,822	8	1289	7	17.39	7
Lowell, Mass.	11	93,588,502	19	829	24	20.80	18
Cambridge, Mass.	12	130,110,820	14	1161	10	23.00	26
Bridgeport, Conn.	13	141,417,321	12	1166	9	19.84	15
Albany, N. Y.	14	134,863,434	13	1144	11	24.02	27
Hartford, Conn.	15	226,030,600	3	1272	8	17.95	9
Trenton, N. J.	16	86,029,714	22	749	29	22.80	25
New Bedford, Mass.	17	111,392,472	16	960	15	23.00	26
Reading, Pa.	18	84,834,624	24	766	28	13.60	2
Camden, N. J.	19	75,233,552	29	683	33	19.78	14
Lynn, Mass.	20	91,840,310	20	908	19	21.80	22
Springfield, Mass.	21	190,365,105	4	1842	1	18.20	10
Wilmington, Del.	22	82,589,225	26	881	21	21.30	20
Lawrence, Mass.	23	82,769,958	25	842	22	18.80	11
Yonkers, N. Y.	24	161,525,072	10	1602	2	20.97	19
Youngstown, Ohio.	25	164,566,580	7	1574	3	14.00	4
Somerville, Mass.	26	77,444,555	28	905	20	21.70	21
Troy, N. Y.	27	68,253,120	33	808	25	32.60	30
Utica, N. Y.	28	80,962,253	27	784	30	25.55	28
Elizabeth, N. J.	29	69,718,384	32	794	27	19.40	13
Waterbury, Conn.	30	89,585,144	21	1054	14	18.91	12
Schenectady, N. Y.	31	74,271,327	30	720	32	37.53	31
Hoboken, N. J.	32	74,157,169	31	930	17	22.34	24
Manchester, N. H.	33	85,217,737	23	933	16	15.80	6

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*Data from Financial Statistics of Cities, 1916, Table 32.

TABLE XIII

TAX LEVIES OF PATERSON COMPARED WITH 32 OTHER CITIES.

Levy per $1,000 true valuation for each of 7 years.
(Levy for all purposes)

Rank of Cities in Population	Levy 1909	Rank	Levy 1910	Rank	Levy 1911	Rank	Levy 1912	Rank	Levy 1913	Rank	Levy 1915	Rank	Levy 1916	Rank
1	$16.02	12	$15.09	17	$10.92	29	$10.82	30	$10.82	31	$10.93	32	$13.60	32
2	16.73	7	16.70	8	11.59	24	11.08	28	11.08	29	10.74	31	15.16	29
3	14.14	19	14.01	20	14.72	17	14.80	14	14.80	15	16.87	13	20.40	18
4	18.02	2	17.58	4	16.53	10	14.14	18	14.14	18	16.57	16	27.77	3
5	14.88	17	16.00	13	16.09	14	14.51	16	14.51	16	17.23	11	22.23	11
6	10.45	29	11.34	26	11.11	26	12.33	22	12.33	23	12.66	26	17.88	26
7*	12.19	23	11.33	27	11.27	25	11.42	26	11.00	30	12.83	25	20.43	17
8	16.25	11	15.84	14	16.41	12	16.48	7	16.48	7	20.06	4	23.00	6
9	14.23	18	14.32	19	11.02	27	10.40	32	10.40	32	11.11	30	13.40	33
10	10.68	27	11.31	28	11.01	28	11.29	27	12.76	22	16.58	15	17.39	27
11	17.30	5	17.02	6	16.47	11	16.41	9	16.41	9	18.78	7	20.80	16
12	17.52	3	18.61	3	17.70	4	17.61	4	18.01	4	18.61	8	23.00	7
13	15.12	15	15.71	15	16.87	7	14.70	15	15.81	10	17.69	10	19.84	9
14	15.39	14	15.39	16	18.34	3	14.93	13	14.93	14	16.80	14	24.02	5
15	16.68	8	16.69	9	17.10	6	15.94	10	15.73	11	15.79	17	17.95	25
16	9.66	31	10.70	31	12.78	21	14.30	17	14.37	17	14.72	19	22.80	9
17	16.56	9	16.14	11	15.88	15	16.77	5	16.77	5	20.04	5	23.00	8
18	10.50	28	10.50	30	10.50	31	10.50	31	11.25	28	11.25	29	13.60	32
19	13.10	20	13.30	23	13.10	20	13.40	21	13.10	21	13.40	23	19.78	20
20	17.89	4	17.10	5	16.71	9	16.62	6	16.62	6	16.94	12	21.80	12
21	12.85	22	13.65	21	14.40	18	13.61	19	13.61	19	14.31	21	18.20	24
22	11.08	20	11.86	25	11.85	23	12.10	24	12.08	25	13.30	24	21.30	14
23	13.98	21	13.61	22	15.05	16	15.05	12	15.05	13	14.94	18	18.80	23
24	21.15	1	22.50	1	22.73	1	24.72	1	24.72	1	20.48	3	20.97	15
25	10.16	30	11.20	29	7.11	33	7.51	33	7.51	33	9.05	33	14.00	30
26	16.30	10	16.12	12	16.83	8	16.45	8	16.45	8	18.27	9	21.70	13
27	17.29	6	19.94	2	19.43	2	23.39	2	23.39	2	23.56	2	32.60	2
28	11.90	24	14.81	18	13.73	19	15.66	11	15.66	12	19.75	6	25.55	4
29	9.60	32	10.36	33	10.61	30	11.04	29	11.34	27	12.02	28	19.40	21
30	11.18	25	12.79	24	12.25	22	13.55	20	13.55	20	13.65	22	18.91	22
31	15.07	15	16.96	7	17.12	5	18.76	3	18.76	3	27.62	1	37.53	1
32	8.76	33	10.43	32	10.58	32	12.16	23	11.94	26	14.58	20	22.34	10
33	15.74	13	16.25	10	16.29	13	12.09	25	12.09	24	12.47	27	15.80	28

*Paterson

medians, twenty-five percentiles, and seventy-five percentiles of all the cities are shown for seven years, together with Paterson's figures for the same period.

TABLE XIV.

TAX RATES PER $1,000 OF ESTIMATED TRUE VALUE OF PROPORTY FOR THE CITIES ON THE 25, 50, AND 75 PER CENTILES OF THE DISTRIBUTION OF ALL CITIES OVER 30,000, COMPARED WITH PATERSON.

1909-1916*

	1909	1910	1911	1912	1913	1915	1916
Paterson	12.19	11.33	11.27	11.42	11.00	12.83	14.19
25 Percentiles	10.19	10.52	10.16	10.05	10.23	10.19	10.58
Medians	12.14	12.91	12.42	12.35	12.04	12.90	13.23
75 Percentiles	15.51	15.80	15.39	14.97	14.79	16.93	16.00

It becomes evident that Paterson has not been raising as large a tax on every $1,000 of estimated true value of property as had the majority of cities up to the year 1916. In 1916 Paterson is found slightly above the median city in the distribution. It is hoped that this ranking will be maintained for the years to come, and even that Paterson may be permitted soon to find herself in the first quartile of such a distribution. Even though Paterson may not have a large per capita valuation, each existing $1000 of property valuation should be required to perform as great a service as has been required of it in other progressive communities, when the demand is as apparent as it has appeared to the survey committee in Paterson.

Although Paterson has not found it feasible to tax herself for the common good as much as many other cities have done, the fact that Paterson lies between the city on the fifty and seventy-five percentiles of the distribution of all cities above 30,000 in the percentage of entire city expenses devoted to schools is significant from the educational point of view. Paterson is at least devoting to education as large a percentage of her entire city appropriations as sixty to seventy per cent of the larger cities. With relatively low tax rates, it is not unreasonable to expect that Paterson should devote even a larger percentage of all municipal maintenance moneys to schools, since with our rapidly mounting cost of living that municipal department is in greatest need of financial assistance which is supporting the largest group of salaried workers. By reference

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*Data for 1914 not available.

TABLE XV.

PER CENT. OF CITY EXPENSES DEVOTED TO SCHOOLS* IN ALL CITIES OF 30,000 OR OVER. (1909-1916)

Per cent.	Number of cities devoting specified per cent. of expenses to schools in						
	1909	1910	1911	1912	1913	1915	1916
10.0-14.9	—	—	2	1	3	1	1
15.0-19.9	2	3	3	4	2	4	4
20.0-24.9	16	16	18	19	20	12	12
25.0-29.9	18	22	26	28	30	38	39
30.0-34.9	42	44	49	44	43	37	34
35.0-39.9	31	43	37	41	40	40	38
40.0-44.9	28	25	33	33	33	33	39
45.0-49.9	12	19	21	19	17	24	26
50.0 54.9	4	6	4	6	9	14	18
55.0-59.9	—	—	—	—	2	—	—
60.0-64.9	—	—	—	—	—	1	2
Total	153	178	193	195	199	204	213
25 Percentile**	30.2	30.3	29.9	29.4	29.2	29.4	29.8
75 Percentile	39.2	41.2	40.8	41.4	41.2	42.6	43.9
Median	34.6	35.4	34.8	35.2	35.2	35.9	36.9
Paterson	39.4	38.9	36.3	38.7	38.6	39.3	40.9

*Compiled from Financial Statistics of Cities of the above years. No report published in 1914.

**The percentiles were calculated from a finer grouping.

TABLE XVI.

TOTAL CITY AND SCHOOL PER CAPITA EXPENDITURES FOR MAINTENANCE AND THEIR PERCENTILE RELATIONSHIPS IN 33 CITIES.*

	Per Capita Expenditure for City Maintenance including Schools	Rank	Per Capita Expenditures for Schools	Rank	Expenditures Devoted Per Cent. of Entire City to Schools	Rank
Column	I	II	III	IV	V	IV
Coumbus	15.43	14	5.63	10	36.5	13.
Toledo	13.83	22	5.49	12	39.7	8
Worcester	20.24	4	7.15	4	35.3	16.5
Syracuse	16.96	7	4.76	21	28.1	31.
New Haven	16.23	10	6.22	6.5	38.3	9.
Scranton	10.76	31	4.72	23	43.9	1.
PATERSON	11.76	29	4.76	21	40.5	7.
Fall River	14.84	17	5.10	16	34.3	22.
Dayton	13.80	23	4.78	19	34.6	20.
Grand Rapids	14.87	16	6.19	8	41.6	5.5
Lowell	14.54	20	4.30	29	29.6	28.
Cambridge	19.84	5	6.22	6.5	31.3	24.
Bridgeport	15.21	15	4.54	26	29.8	27.
Albany	17.35	6	4.76	21	27.4	32.
Hartford	21.27	3	7.57	2	35.6	15.
Trenton	13.51	24	5.67	9	41.9	4.
New Bedford	15.61	12.5	4.67	25	29.9	26.
Reading	9.07	33	3.30	32	36.4	14.
Camden	13.26	26	5.57	11	42.0	3.
Lynn	15.61	12.5	4.47	28	28.7	29.
Springfield	24.87	1	8.65	1	34.8	18.
Wilmington	10.03	32	3.48	31	34.7	19.
Lawrence	13.36	25	4.29	30	32.1	23.
Yonkers	23.61	2	7.35	3	31.1	25.
Youngstown	11.69	30	5.04	17	43.2	2.
Somerville	15.89	11	5.46	15	34.4	21.
Troy	16.50	8	4.69	24	28.4	30.
Utica	14.20	21	5.01	18	35.3	16.5
Elizabeth	11.86	28	4.48	27	37.7	10.
Waterbury	14.66	18	5.47	13.5	37.3	12.
Schenectady	14.63	19	5.47	13.5	37.4	11.
Hoboken	16.27	9	6.76	5	41.6	5.5
Manchester	12.73	27	3.08	33	24.2	33.

Financial Statistics of Cities, 1916.

to Table XV it will be observed that Paterson ranks above the median for all the years for which data are presented.

The percentage of entire city expenditures devoted to schools with respect to the selected group of cities appear in Table XVI. In order to prevent any misinterpretation of the high ranking of Paterson in column 6 of Table XVI, the per capita expenditures for city maintenance including schools, and the per capita expenditures for schools alone, are also given. The ranking of Paterson on these last two items as compared with other cities in the list is what might be expected from the facts of Table XV.

It becomes clear that although Paterson spends less per capita than twenty-eight of the cities in the list on city maintenance, the percentage devoted to schools of the relatively small total is greater than the percentage so allotted by twenty-eight cities of the list.

Though Paterson pays toward the support of public education a fairly large proportion of all moneys paid out for municipal purposes, total population per capita expenditure for schools falls below the median and the average of the selected cities. Paterson will be found in Table XVII as ranking twenty-first out of thirty-three cities when amount paid for schools is considered with the single inhabitant of the city as the basal unit. In this table Paterson's per capita expenditures for other municipal purposes are compared with the average and medians of the group of selected cities. The average rank for Paterson on all ten items of this table is twenty-three.

Paterson's rank on none of the ten items is higher than eleven out of thirty-three, this being the rank of expenses for the fire department. Paterson ranks particularly low in her per capita expenditures for recreation, schools, sanitation, streets, and charities, hospitals, and corrections. If Paterson had been the median city on the nine items in which she is found lower

TABLE XVII.

PATERSON COMPARED WITH THIRTY-TWO SELECTED CITIES ON TEN ITEMS OF CITY MAINTENANCE

Basis of Comparison—The Expenditure for Each Inhabitant.*

Item	Per Capita Costs.			
	City of Paterson	Average for 33 Selected Cities.	Median of 33 Selected Cities.	Rank of Paterson Among the 33 Cities on Basis of the Amount Spent.
1 General Government	$ .67	$ 1.21	$ 1.13	33
2 Police Department	1.41	1.60	1.44	18
3 Fire Department	1.72	1.62	1.57	11
4 Health and Sanitation	1.12	1.64	1.47	28
5 Highways	.79	1.73	1.74	33
6 Charities, Hospitals & Corrections	.46	.83	.78	33
7 Schools	4.76	5.31	5.04	21
8 Libraries	.21	.25	.22	19
9 Recreation	.29	.44	.32	20
10 Miscellaneous & General	.27	.38	.34	19
Total Per Capita Cost**	$11.76	$15.28	$14.84	29

*Data taken from Financial Statistics of Cities, 1916, pp. 230 ff.

**Includes more than the ten items above.

than the median, further exxpenditures would have been necessary for the year 1916, as shown below. The amounts that Paterson should have added to reach the average in the nine items are also given.

TABLE XVIII.

ADDITIONAL AMOUNTS PATERSON* WOULD HAVE SPENT IN 1916 IF LOCATED AT THE MEDIAN OR AS THE AVERAGE OF THE 33 SELECTED CITIES.

	Item	Amount needed to reach average	Amount needed to displace median
1	General Government	$ 74,200	$ 63,207
2	Police Department	26,107	4,122
3	Fire Department	Paterson is above median & average for 1916	
4	Health & Sanitation	71,452	48,092
5	Highways	129,163	130,537
6	Charities, Hospitals & Corrections	50,840	43,670
7	Schools	75,574	38,474
8	Libraries	5,496	1,374
9	Recreation	20,611	4,122
10	Miscellaneous & General	15,114	9,618
	Total Per Capita**	$483,676	$423,216

*Population for 1916 estimated at 137,408.

**Includes more than the ten items above.

If the public school system had had available even the additional amount, $38,744, as shown in Table XVIII, it might have been very readily employed in advancing the interests of the Paterson school children.

In the final analysis the real measure of whether a community is paying what should be paid for educational purposes is the amount of money spent per pupil in average daily attendance. That the most equitable comparison might be made, the amounts spent per pupil in average daily attendance for the years 1907-16 for all cities of 25,000 or over, north of the Ohio River and

Mason-Dixon Line and east of the Mississippi River, have been computed from the annual reports of the Commissioner of Education for the years 1908-17. The amounts spent in Paterson and in the median cities are given for each year in Table XIX, with the number of cities included in each year's distribution from which the medians were obtained.

TABLE XIX.

MEDIANS OF AMOUNTS SPENT FOR SCHOOL MAINTENANCE PER PUPIL IN AVERAGE DAILY ATTENDANCE FOR THE YEARS 1907-1916 FOR ALL CITIES NORTH OF THE OHIO RIVER AND MASON-DIXON LINE AND EAST OF THE MISSISSIPPI RIVER HAVING A POPULATION OF 25,000 OR OVER.

Years	No. of Cities	Median Cost per Pupil in Average Daily Attendance	Paterson's Cost per Pupil in Average Daily Attendance	Difference Between Paterson's Cost and the Median Cost.
1907-08	125	$33.44	$31.61	$1.83
1908-09	131	33.44	28.23	5.21
1909-10	118	34.78	29.55	5.23
1910-11	98	36.00	28.94	7.06
1911-12	120	37.82	31.27	6.55
1912-13	124	38.70	33.85	4.85
1913-14	131	39.40	33.16	6.24
1914-15	125	40.79	32.70	8.09
1915-16	136	43.21	33.82	9.39

Paterson's cost per pupil in average daily attendance is less each year than that of the median city. The difference between these two factors has increased over this period of years until in 1915-16 Paterson had fallen $9.39 lower than the median. If it were possible to point out that irrespective of the low expenditures, Paterson had maintained its school system at the standard reached in other school systems which were spending more money per pupil, the fact would be gratifying. The probabilities are, however, that failure on the part of the school system to keep pace with increased costs in all other enterprises means a lowering of standards or the demand for unreasonable sacrifice which can under no conditions be more than temporary. That Paterson has not been appropriating sufficient money for its educational system is quite apparent from the reports on buildings, equipment, special classes, playgrounds, and the like. That other cities have found it necessary to spend more money for education is one good reason why Paterson should follow their leadership. In no clearer way could Paterson's failure to keep pace with the increased expenditures of other cities for education be pictured than by the distribution of Table XX. The progress of Paterson and the median city is shown during the period of the distribution. The trend of the table is distinctly upward. Paterson's position appears static.

TABLE XX.

THE DISTRIBUTION OF CITIES NORTH OF THE OHIO RIVER AND MASON-DIXON LINE AND EAST OF THE MISSISSIPPI RIVER, HAVING POPULATIONS OF 25,000 OR OVER, ON THE BASIS OF THE AMOUNT SPENT FOR SCHOOL MAINTENANCE PER PUPIL IN AVERAGE DAILY ATTENDANCE FOR THE YEARS 1907-1916.

Number of cities spending per pupil in average daily attendance a sum from—

Years	$16--20.99	$21--25.99	$26--30.99	$31--35.99	$36--40.99	$41--45.99	$46--50.99	$51--55.99	$56--60.99	$61--65.99	$66--70.99	$76--80.99	$81--85.99	$86-90.99
1907-08	1	9	32	P41*	29	8	4							
1908-09	1	7	P 36	42*	26	14	8		1					
1909-10		5	P 25	37*	30	10	7	1	2					
1910-11		6	P 14	28	27*	12	6	2	1					
1911-12		4	17	P 26	33*	24	10	4			1			
1912-13		2	8	P 32	35*	23	10	8	8	1				
1913-14	1	1	9	P 29	36*	23	17	11	3					
1914-15			7	P 20	36	27*	15	7	9	2	1			
1915-16		1	4	P 20	27	34*	24	14	9	1		1		

*The median city falls in this group.
P—Paterson.

Data for all thirty-three of the selected cities were not available in the annual reports of the Commissioner of Education for computing the costs per pupil in average daily attendance for each of the years 1907-16. Such data as were available in the Commissioner's reports were utilized in making Table XXI.

TABLE XXI.

COST PER PUPIL IN AVERAGE DAILY ATTENDANCE IN THE SELECTED GROUP OF CITIES AS COMPARED WITH PATERSON'S COST. 1907-08 -- 1915-16.*

	1907-08	1908-09	1909-10	1910-11	1911-12	1912-13	1913-14	1914-15	1915-16
Number of Cities for which Data were Available.	28	30	24	18	29	28	28	30	30
Paterson's Rank	20	28	21	18	26	25	26	29	27
Lowest Cost	$23.99	$23.83	$24.65	$28.94	$24.16	$29.04	$26.50	$30.66	$32.66
Highest Cost	41.94	45.61	48.81	48.51	52.11	53.67	54.16	58.50	60.92
Average Cost	33.68	35.29	36.46	38.46	38.72	39.46	41.07	42.29	43.58
Cost in Paterson	31.61	28.23	29.55	28.94	31.27	33.85	33.16	32.70	33.82
Amount Paterson is Below the Average	2.07	7.06	6.91	9.52	7.45	5.61	7.91	9.59	9.76

*Annual Reports of the United States Commissioner of Education.

Practically the same conclusions hold for the thirty-three cities as were found to be true of all the cities of Table XX. In 1915-16 Paterson was $9.76 below the average of the group in expenditure per pupil in average daily attendance. In no other year was the difference as great as that of 1915-16. Paterson has not been progressing in her expenditures for schools at the same rate as the average of the selected cities.

Since Paterson's expenditure per pupil in average daily attendance has been quite low it should be ascertained on what items of the budget the greatest economy has been practiced. The comparisons given in Table XXII have been confined to nine major items:

1. Expenses of administration—including board of education and business offices and superintendent's office.
2. Salaries and expenses of principals and supervisors.
3. Salaries of teachers.
4. Cost of text-books stationery and supplies and other instructional expenses.
5. Wages of janitors and other employees.
6. Cost of fuel, water, light, power, and janitor's supplies.
7. Cost of maintenance, repairs and replacement of equipment.
8. Promotion of health.

9. Libraries, payments to other schools, rent, pensions, transportation of pupils, and the like.

The expenditures are from the last available report of the Commissioner of Education, i. e., for the year 1916. The basal unit is the pupil in average daily attendance for that year. If Paterson had been the median city in this table, instead of ranking as low as was done on the nine items, the following additional sums of money would have been available for those items for the year 1915-16.

Item 1	Administration	$ 9,668.00
2	Principals and Supervisors	20,664.00
3	Salaries of Teachers	65,784.00
4	Text-books and Supplies	7,962.00
5	Wages of Janitors, etc.	10,047.00
6	Fuel, Water, Janitors' S'pl's, etc.	17,820.00
7	Maintenance, Repairs, Replac'ts	24,455.00
8	Promotion of Health	3,981.00
9	Libraries, Pensions, etc.	6,635.00

Other sections of the Survey Committee's report will show the need for the expenditure of these additional sums on the majority of these nine items. It is true that Paterson's low rank on such an item as No. 6 may appear to be due to a wise economy. On the other hand, the reports on the cleaning of buildings, the supplies furnished in toilet rooms, and the fire extinguishing

TABLE XXII.

EXPENDITURE IN THIRTY-ONE* CITIES ON NINE MAJOR ITEMS OF SCHOOL MAINTENANCE, BASED ON PER CAPITA OF AVERAGE DAILY ATTENDANCE. DATA FOR SCHOOL YEAR 1915-16.**

City	Expenditure per Pupil in Average Daily Attendance for								
	1	2	3	4	5	6	7	8	9
	Administration	Principals' and Supervisors' Salaries	Teachers' Salaries	Textbooks, Stationery and Other Supplies	Wages of Janitors and Other Employees	Fuel, Water, Light, Power and Janitors' Supplies	Maintenance, Repairs and Replacements	Promotion of Health	Libraries, Pensions, Transportation, etc.
Columbus	$1.24	$4.16	$32.82	$1.17	$3.71	$1.60	$1.51	$ .21	$1.69
Toledo	1.59	3.34	29.87	1.85	2.55	1.83	2.09	.52	1.05
Worcester	1.40	4.01	31.01	2.03	3.42	2.53	2.66	.18	.35
Syracuse	.91	6.41	22.07	.92	2.52	1.85	3.99	.56	.16
New Haven	.70	1.02	24.47	4.10	2.59	1.97	.24		.13
Scranton	1.60	3.50	19.82	2.01	2.75	1.59	2.18	.36	.39
PATERSON	.86	3.13	23.94	1.49	2.44	1.09	.80	.09	.04
Fall River	1.32	4.60	28.20	2.03	4.30	1.23	3.07	.17	.32
Dayton	1.05	3.27	24.98	1.11	2.44	1.54	3.16	.30	.42
Grand Rapids	2.36	4.95	36.00	2.52	3.70	2.68	2.97	.	.94
Lowell	1.00	.56	26.05	2.66	4.83	2.31	.53	.33	2.82
Cambridge	2.04	4.22	33.31	2.44	3.79	1.45	1.53		.03
Bridgeport	.92	3.24	25.49	1.38	1.98	1.30	1.94	.	.16
Albany***	1.21	5.47	28.68	3.24	2.83	3.55	1.79	.58	.86
Hartford	.80	5.12	32.27	2.52	3.48	3.27	4.13	.08	2.32
Trenton	1.56	****	****	2.34	2.51	1.61	2.09	.67	.18
New Bedford	1.37	4.71	24.60	1.34	3.14	2.21	.70	.18	.30
Reading	2.26	1.51	19.47	2.61	2.59	1.71	1.39	.42	.71
Camden	1.43	4.28	28.17	3.29	3.30	1.99	2.95	.41	.70
Lynn	1.47	2.68	24.03	1.76	2.97	2.15	1.05	.20	.47
Springfield	1.91	5.09	36.39	5.39	4.22	4.00	3.07	.60	.19
Lawrence	1.14	5.49	26.44	1.38	2.63	2.33	2.14		.85
Yonkers	1.82	5.73	36.52	2.84	3.21	2.37	2.09	.42	.32
Youngstown	1.04	4.22	29.59	1.91	3.76	2.03	3.11	.30	1.92
Somerville	.79	3.48	19.52	1.71	2.40	2.59	1.76	.31	.16
Troy	1.80	6.40	30.84	.78	4.59	3.05	1.74	.92	4.06
Utica	1.48	3.32	29.23	1.39	2.71	2.99	2.11	.60	.03
Waterbury	1.07	4.26	20.92	1.16	1.69	2.18	2.01		.17
Schenectady	.99	4.47	27.41	1.66	3.14	3.00	1.66	.87	.49
Hoboken	2.48	3.53	41.09	1.79	4.33	2.03	2.37	1.04	.37
Manchester***	1.48	6.31	20.28	2.06	2.23	4.35	.28		.54
Rank of Paterson	28	27	25	22	26.5	31	27	23	29
Median City	$1.37	$4.22	$27.41	$1.91	$2.97	$2.03	$2.09	$ .30	$ .39
Amount Paterson is Below Median	$ .51	$1.09	$ 3.47	$ .42	$ .53	$ .94	$1.29	$ .21	$ .35

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*Data for Wilmington and Elizabeth not available.

**U. S. Commissioner of Education Report for 1917, pp. 202 ff.

***Data for 1914-15.

****Report does not separate these data.

equipment have pointed out the reasons for the need of a more extensive supply of very essential materials. Presumably this increase can only be secured with a greater expenditure.

Paterson's average rank in the group of cities on all items of Table XXIII is 26. That this is the lowest average rank for all the cities, as shown in Table XXIII, makes it clear that additional appropriations for educa-

TABLE XXIII.

RANKS OF THE THIRTY-ONE CITIES OF TABLE XXII ON THE NINE ITEMS OF SCHOOL MAINTENANCE OF THAT TABULATION

Rank on	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Average Rank
Columbus	18	17	6	27	8	25	24	18	5	16
Toledo	9	19	10	17	23	22	15	9	6	14
Worcester	15	18	8	13.5	11	10	9	20.5	18	14
Syracuse	27	1	25	30	24	21	2	8	26	17
New Haven	31	29	22	2	21.5	20	31	28	28	24
Scranton	8	21	28	15	18	26	11	13	16	17
PATERSON	28	26	24	22	26.5	31	27	23	29	26
Fall River	17	11	14	13.5	4	30	5.5	22	19.5	15
Dayton	22	24	20	29	26.5	27	3	16.5	15	20
Grand Rapids	2	9	4	8.5	9	8	7	28	7	9
Lowell	24	30	18	6	1	13	29	14	2	15
Cambridge	4	15.5	5	10	6	28	23	28	30.5	17
Bridgeport	26	25	19	24.5	30	29	18	28	26	25
Albany	19	6	13	4	17	3	19	7	8	11
Hartford	29	7	7	8.5	10	4	1	24	3	10
Trenton	10			11	25	24	15	4	23	14
New Bedford	16	10	21	26	14.5	14	28	20.5	21	19
Reading	3	28	30	7	21.5	23	25	10.5	10	18
Camden	14	13	15	3	12	19	8	12	11	12
Lynn	13	27	23	19	16	16	26	19	14	19
Springfield	5	8	3	1	5	2	5.5	5.5	22	6
Lawrence	20	5	17	24.5	20	12	12	28	9	16
Yonkers	6	4	2	5	13	11	15	10.5	19.5	10
Youngstown	23	15.5	11	16	7	17.5	4	16.5	4	13
Somerville	30	22	29	20	28	9	20	15	26	22
Troy	7	2	9	31	2	5	21	2	1	9
Utica	11.5	23	12	23	19	7	13	5.5	30.5	16
Waterbury	21	14	26	28	31	15	17	28	24	23
Schenectady	25	12	16	21	14.5	6	22	3	13	12
Hoboken	1	20	1	18	3	17.5	10	1	17	10
Manchester	11.5	3	27	12	29	1	30	28	12	17

tion would be of greater advantage to the Paterson schools.

PER CAPITA EXPENDITURES FOR SCHOOL BUILDINGS.

The unfavorable report of the condition of the physical school plant of the Paterson school system makes it desirable that consideration be given the expenditures that Paterson and other cities have incurred over a period of years for the erection of new buildings and purchase of new equipment. Have Paterson's per capita expenditures for school buildings kept pace with those of other cities? The answer is given in Table XXIV. Here are presented the per capita expenditures for school buildings for all cities over 25,000 for which the basic data were available in the annual reports of the United States Commissioner of Education. The period covered includes the years 1900-1916. The population for each city for the period 1900-1910 was estimated by taking the difference between the United States census figures for 1900 and 1910, dividing this difference by ten, and adding the increment thus obtained to each successive year beginning with the year 1900. The populations for the period 1900-1916 were taken from the estimates found in the Financial Statistics of Cities.

Paterson ranks above the median of all cities in this tabulation. Ninety-six other cities out of the two

TABLE XXIV.

DISTRIBUTION OF PER CAPITA EXPENDITURES FOR SCHOOL OUTLAYS FOR 206 CITIES FOR TOTAL PERIOD 1899-1916.

All Cities.

Amount	No. of Cities
0—$ 1.99	6
2— 3.99	11
4— 5.99	11
6— 7.99	9
8— 9.99	21
10— 11.99	15
12— 13.99	20
14— 15.99	29
16— 17.99	12
18— 19.99	18
20— 21.99	17
22— 23.99	8
24— 25.99	12
26— 27.99	5
28— 29.99	4
30— 31.99	3
32— 33.99	2
34— 35.99	2
36— 37.99	0
38— 39.99	0
40— 41.99	1
Total	206 Cities

25 Percentile	$ 9.33
Median	14.68
75 Percentile	20.24
Paterson for same period	$15.31

hundred and six have appropriated more than Paterson during this period for school buildings on the basis of per capita of total population. It is evident from Table XXV that Paterson's expenditures for capital outlays have also kept pace with that of the majority of cities of the selected group. Only the selected cities for which approximately all data were available were included in this table.

TABLE XXV.

PER CAPITA EXPENDITURES FOR SCHOOL OUTLAYS FOR PATERSON AND TWENTY-FIVE OTHER CITIES

City	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	Total
Columbus		.78			.23	.54	.76	.78	.51	.85	.53		63		1.11	.88	.85	7.90
Toledo	.16	.24	.16	.47	.17	1.68	2.10	1.50	2.90	1.30	.35		3.62	3.27	2.17	2.70	4.19	26.98
Worcester	1.17	.89	.03	.03	.03	.29				.46	.45		.76	3.77	2.44	1.72		12.04
New Haven	.11	.32	.37	.20	.14	.01	.58	.85	.82	1.08	.89	1.30	1.23		1.43	1.18	2.21	12.74
Scranton	.91	1.38	1.82	.78	1.75	1.03	.50	.34	1.74		1.03			.03	.36	.35		12.80
PATERSON	1.22	.18	.06	.06		.34	1.51	.44	.61	1.98	2.68	1.28	1.43	1.13	.73	.89	.77	15.31
Fall River	.89	.43	.07	.07			.43	.57	.55	.94		.93	1.79	1.04		.48		8.19
Dayton	.44	.82	1.01	.98	.34	.18	.49	.23	1.29	.51		.07	.47	.47	1.68	.89	1.86	11.73
Grand Rapids	.76	.33	.38	.37	.17	.11	.90	.49	.73	2.06	3.41	1.85	.86	.28	1.41	3.80	2.02	19.93
Cambridge	2.67	1.48	1.08	.37	1.24	.78	1.29	1.07	.44	3.48	.73			3.63	.07	3.63	.57	15.02
Bridgeport	.90	.86	.36	.34	.78	.33	.55	.68	.83	.60	.93		.78		1.37	4.89	1.40	15.55
Hartford	1.07	.81		1.02		.04	1.10	2.00		1.55	.96	.47		2.49	3.77		5.55	20.83
Trenton			1.70	.97	.94	.37	.59	.29	1.20	.53	.64		1.25	1.35	1.51	.70	2.22	14.26
New Bedford	.61	1.73	.86	.82	.46	.94	2.57	.67	.39	1.38	.43		.39	2.39	1.32	.13	.06	15.15
Reading	.61	1.01	.68	.21	1.12	1.10	1.88	1.14	.05	.04	.04			.67	.37	.09	.05	8.56
Camden	.21	.30		.12	.13	.13	.24	.75	1.74	1.70		.52	.34	.48	1.84	.52	.25	9.56
Lynn			.17				.44		.76	.63	1.12	2.71	1.30		.64	2.21	3.32	13.30
Springfield			1.42		.55					1.61	.61	.72	.86	2.24	4.25	7.21	.53	20.00
Lawrence	.23	3.91	1.64	.66	.33	1.32	.88	.01		.29						.08		9.35
Yonkers	1.43	2.09	1.72	2.05	1.97	1.87	1.38	2.50	2.63	2.13	2.05	2.15	1.65	1.94	1.10	.34	.81	29.81
Youngstown	.27	.32	.76	.92	.47	.44	.74	.74	.93	2.10	1.73		2.70	2.33	1.42	2.66	2.51	21.04
Somerville	1.43	1.15	.75	.88	.88	.60	.73	.69		.17	.01		.88	.58	1.44	1.16	.94	12.29
Utica	1.38	.94	1.24	.20	.21	.20	.04	.09	.34	2.67	.57	.02	.17	.41	1.70	2.01	3.66	15.85
Waterbury	2.83	.27	.43	1.18	.65	.82	.32	.75	.98	.28	.53	.81	.30	.64	.81	1.63	3.05	16.28
Schenectady	.40	.80	1.10	1.42	1.98	1.82	.59	.23		5.41	.21			4.11	1.01	3.81	.45	23.34
Hoboken					2.06	2.00					1.42	3.49	3.00		.08	1.54	1.26	14.85

Rank of Paterson for the period 1900-1916	11
Total number of cities	26

It will be seen that Paterson ranks eleventh among the twenty-six cities of the list.

PATERSON'S CITY AND SCHOOL DEBT.

If Paterson's net debt incurred for past municipal activities had been extremely overburdensome as far as the payment of both interest and principal was con-

TABLE XXVI.

PER CAPITA NET DEBT* OF PATERSON AND THIRTY-TWO OTHER CITIES

City	Per Capita Net Debt	Rank in Net Debt
Columbus	$49.08	15
Toledo	64.28	7
Worcester	49.63	14
Syracuse	64.70	6
New Haven	30.59	27
Scranton	19.83	31
PATERSON	37.00	21
Fall River	41.82	20
Dayton	52.92	12
Grand Rapids	30.87	26
Lowell	24.39	29
Cambridge	61.87	9
Bridgeport	31.05	25
Albany	67.10	5
Hartford	91.43	1
Trenton	28.66	28
New Bedford	70.55	4
Reading	20.54	30
Camden	46.10	17
Lynn	43.06	19
Springfield	74.81	3
Wilmington	59.45	10
Lawrence	34.29	23
Yonkers	91.02	2
Youngstown	50.54	13
Somerville	19.31	32
Troy	63.88	8
Utica	33.90	24
Elizabeth	35.05	22
Waterbury	59.22	11
Schenectady	48.83	16
Hoboken	44.15	18
Manchester	17.12	33

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*Financial Statistics of Cities, 1916, pp. 320 ff.

cerned, it might be recorded as an additional reason why the current expenditures for all municipal purposes should be kept low. Paterson, however, was not in 1916 burdened with an excessive net debt as compared with the group of selected cities. As shown in Table XXVI, Paterson's rank is twenty-one in the list of thirty-three cities on the basis of per capita net debt.

TABLE XXVII.

FUNDED DEBT INCURRED IN THE ERECTION OF SCHOOL BUILDINGS AS EXISTING IN 1916.

	In cities whose population in 1916 was*	
Debts of	100,000 to 300,000	50,000 to 100,000
Less than $100,000	1	5
$100,001— 300,000		8
300,001— 500,000		12
500,001— 700,000	3	9
700,001— 900,000	4	6
900,001—1,100,000	4	5
1,100,001—1,300,000	5	5
1,300,001—1,500,000	8	6
1,500,001—1,700,000	7	1
1,700,001—1,900,000	1	3
1,900,001—2,100,000	3	1
2,100,001—2,300,000	1	1
2,300,001—2,500,000		
2,500,001—2,700,000		
2,700,001—2,900,000		
2,900,001—3,100,000		
3,100,001—4,000,000	5	
4,000,001—5,000,000	1	
5,000,001—6,000,000		
6,000,001—7,000,000		
7,000,001—8,000,000	1	
8,000,001—9,000,000		
9,000,001--10,000,000		
Over 10,000,000		
Total Number of Cities	44	62
Median Points**	1,225,000	633,000

*Compiled from Financial Statistics of Cities, 1916, pp. 326 ff.

**Approximate.

The funded net debt incurred in the erection of school buildings as existing in 1916 in all cities of the United States from 50,000 to 300,000 population is shown in Table XXVII. Paterson, with a funded debt of $2,005,000, ranks high in the list. Only seven cities of the group mentioned have funded school debts exceeding this amount.

It is unfortunate that this excessive funded debt has been allowed to accumulate, especially in the light of the extremely low ratings given to a number of the present school buildings by the Survey Committee.

The following summary presents a re-statement of Paterson's ranks on each phase of financial comparison as clearly as can be shown from available data.

PATERSON'S RANKS ON FINANCIAL TABULATIONS

	Paterson as compared with 32 selected cities, 1916.
Total true valuation of property	15
Per capita true valuation of property	26
Tax levy $1000 true valuation, Years 1909, 1910, 1911, 1912, 1913, 1915, 1916,	23-27-25-26-30-25-17
Per cent of city expenditures devoted to schools	9
Per capita expenditures for schools	21

Per capita expenditures for city maintenance, including schools	29
Cost per pupil in average daily at'nce	27
Expenditure per pupil in average daily attendance for administration	28
For principals' and supervisors' salaries	27
Teachers' salaries	25
Text-books and supplies	22
Wages of janitors, etc.	26.5
Fuel, water, light and janitors' suplies	31
Maintenance and repairs	27
Promotion of health	23
Libraries, pensions, transportation, etc.	29
Per capita expenditures for school buildings, 1899-1916	11
Per capita net debt	21
Funded debt	26

THE SURVEY OF PATERSON'S SCHOOL BUILDINGS

To know the efficiency of a school system is to know the adequacy of the plant in which it is housed, as well as the adequacy of the educational factors involved. A measure of results which does not take into account the physical conditions under which results are secured is obviously incomplete and unfair. The most perfectly organized and highly trained teaching and supervisory staff cannot produce to the limit of its capacity if it is required to work in a plant that does not meet its needs. No department of health supervision, however well it may be staffed and supported, can combat successfully the evils of unhealthful, unsanitary housing conditions. School attendance is likewise affected for good or bad by the kind of buildings the children are asked to attend. It is essential, therefor, if measures of a school system are to be taken, comparisons made, conclusions drawn, and responsibility placed, that the plant be measured and weighted as carefully as any other factor.

A further and less significant service of the building survey is the basis it provides for a building program. To build wisely and economically a city must have available the detailed facts concerning the adequacy and conditions of the existing plant. All extensions and alterations must be made in terms of the greatest needs and in the light of future use. Good administration demands that the building needs of the city be known over a period of years in advance, and that as definite a program as practicable be laid down to meet both the housing requirements and the burden of cost. Business corporations, whose policy is determined by the demands that dividends be declared, that the investment pay, look into the future even more searchingly than into the past. Experience to them is valuable only in so far as it helps more wisely to determine plans for the future. The sooner public schools come to the business point of view, formulating a program in the light of future needs, the sooner they will have the confidence of the business world and the support of the taxpayer. It is the recommendation of the committee that the city of Paterson supplement at the earliest possible date the building survey with a complete building program.

THE PRESENT SCHOOL PLANT

Under the jurisdiction of the Paterson School Board there are twenty-five elementary schools, one high school, and one truant school. Table XXVIII shows the distribution of these buildings according to the date of original construction and the date of additions,

TABLE XXVIII.

DATE OF ORIGINAL ERECTION AND DATE OF ADDITIONS TO PATERSON'S ELEMENTARY SCHOOL BUILDINGS. DISTRIBUTED BY BUILDINGS.

School No.	No. of Rooms	Date	No. of Rooms	Date	No. of Rooms	Date	No. of Rooms
1	19	1894	19				
2	17	1874	13	1905	4		
3	22	1899	22				
4	29	1857	12		3	1900	14
5	24	1879	12	1900	12		
6	20	1870	20				
7	9	1873	9				
8	10	1885	10				
9	35	1896	5	1899	8	1912	22
10	41	1918	41				
11	12	1881	12				
12	34	1912	34				
13	18	1884	10	1894	8		
14	12	1886	12				
15	22	1905	22				
16	18	1891	18				
17	12	1892	12				
18	18	1892	18				
19	12	1896	12				
20	13	1898	13				
21	30	1906	16	1916	14		
22	12	1907	12				
23	24	1910	24				
24	24	1908	24				

together with the number of rooms originally constructed or added. In comparison with St. Paul and Omaha it will be noted that the rate of building has been fairly consistent, showing only one four-year lapse (1900-04) in original constructions. During that period additions to the extent of thirty-four rooms were made.

It will be noted further, however, that more than 70 per cent. of these buildings were erected previous to 1900. In view of this fact, and upon consideration of the rapid rise in standards set by modern school architecture, it is not to be expected that these buildings will meet the demands upon a modern school building. The fact that 87 per cent. of the additions have been made since 1900 is partly offset by the fact that additions so often reproduce the errors of construction of the original building. The citizens of Paterson will not, therefore, be surprised on learning that a considerable part of their school plant is below the lowest acceptable standard.

In measuring the school plant the survey committee applied the standards recognized as best in modern school buildings. A School Building Score Card was used for this purpose.* A school building meeting all of the standards of this card would score 1000 points. In the degree to which a building does meet these standards its score is determined. A building approaching perfection in all details, or perfect in all but a few, may be expected to score between 900 and 1000 points. Such buildings are rarely found. A score of from 700 to 900 points is indicative of a fairly satisfactory building,—one in which the demands of modern school practice can be reasonably well carried out. Considerable alterations are recommended in the case of buildings scoring between 600 and 700 points. With due recognition of the weaknesses as pointed out in the detailed score, such a building can be raised to a satisfactory standard of efficiency. A building which scores between 500 and 600 is a very poor building, and can be made passably good only by extensive alterations and repairs. In the judgment of those who have used the score card extensively and who are well acquainted with the prevailing standards for school accommodations, a building which scores less than 500 is one which should be abandoned as soon as possible. It is poor economy to repair such a building with the expectation of making it suitable for school purposes. The 1000 points alloted to a perfect school building have been distributed among the 112 constituent elements according to the judgment of a large number of competent educators from all sections of the United States. Table XXIX lists the elements and shows the distribution of points.

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*Strayer, G. D., A Score Card for School Buildings, published by the Bureau of Publications, Teachers College, Columbia University, New York City.

TABLE XXIX.

SCORE CARD OF BUILDING.

I. SITE	125
A. Location	55
1. Accessibility	25
2. Environment	30
B. Drainage	30
1. Elevation	20
2. Nature of soil	10
C. Size and Form	40
II. BUILDING	165
A. Placement	25
1. Orientation	15
2. Position on site	10
B. Gross Structure	60
1. Type	5
2. Material	10
3. Height	5
4. Roof	5
5. Foundations	5
6. Walls	5
7. Entrances	10
8. Aesthetic balance	5
9. Condition	10
C. Internal Structure	80
1. Stairways	35
2. Corridors	20
3. Basement	15
4. Color scheme	5
5. Attic	5
III. SERVICE SYSTEMS	280
A. Heating and Ventilation	70
1. Kind	10
2. Installation	10
3. Air supply	15
4. Fans and motors	10
5. Distribution	10
6. Temperature control	10
7. Special provisions	5
B. Fire Protection System	65
1. Apparatus	10
2. Fireproofness	15
3. Escapes	20
4. Electric wiring	5
5. Fire door and partitions	10
6. Exit lights and signs	5
C. Cleaning System	20
1. Kind	5
2. Installation	5
3. Efficiency	10
D. Artificial Lighting System	20
1. Gas and electricity	5
2. Outlets and adjustment	5
3. Illumination	5
4. Method and fixtures	5
E. Electric Service System	15
1. Clock	5
2. Bell	5
3. Telephone	5
F. Water Supply System	30
1. Drinking	10
2. Washing	10
3. Bathing	5
4. Hot and cold	5
G. Toilet System	50
1. Distribution	10
2. Fixtures	10
3. Adequacy and arrange't	10
4. Seclusion	5
5. Sanitation	15
H. Mechanical Service System	10
1. Elevator	5
2. Book-lifts	2
3. Waste-chutes	3
IV. CLASS ROOMS	290
A. Location and Connection	35
B. Construction and Finish	95
1. Size	25
2. Shape	15
3. Floors	10
4. Walls	10
5. Doors	5
6. Closets	5
7. Blackboards	10
8. Bulletin Board	5
9. Color Scheme	10
C. Illumination	85
1. Glass area	45
2. Windows	30
3. Shades	10
D. Cloakrooms and Wardrobes	25
E. Equipment	50
1. Seats and desks	35
2. Teacher's desk	10
3. Other equipment	5
V. SECIAL ROOMS	140
A. Large rooms for General Use	65
1. Playrooms	10
2. Auditorium	15
3. Study Hall	5
4. Library	10
5. Gymnasium	10
6. Swimming Pool	5
7. Lunch room	10
B. Rooms for School Officials	35
1. Officers	10
2. Teacher's room	10
3. Nurses' room	10
4. Janitor's room	5
C. Other Special Service Rooms	40
1. Laboratories	20
2. Lecture rooms	10
3. Store rooms	5
4. Studios	5
TOTALS	1,000

It is impossible to include here a copy of all of the detailed standards by which every school building was judged.* Some of the most important standards are here given.

STANDARDS FOR JUDGING THE SITE OF BUILDING

The present and future accessibility of the site to car lines, streets and homes; its adornment with gardens, trees, shrubbery, and the like; the vicinity of undesirable places of influence; freedom from noises, dust, dangers, and malodors, the type of street pavement about the school; drainage of the soil, the nature of soil; the size and shape of playground, with a minimum of 100 square feet per child; equipment of the playground.

SOME STANDARDS FOR JUDGING THE BUILDING ITSELF

Southeast, east, and southwest orientations are preferred in the order named; fireproof construction; preferably T, H, E, or U type; height two stories above ground floor; flat, waterproof roof; water and damp-proof foundations; main entrance 10 to 12 feet wide; secondary entrances 8 to 10 feet wide; entrances for playrooms, for the heating rooms, for the kindergarten room, if possible; outside stairs to be stone or concrete, with non-slipping tread; doors swinging outward, provided with fire bolts, checks, and foot stops; stairways positively fireproof, separated from corridors by fire glass doors and partitions; two sets of handrails for varying sizes of children, with 5 feet treads, 10 to 12 inches wide, risers 6⅛ inches; should be accessibe to classrooms; no storage rooms should be under the classrooms unless strictly fire-proof; corridors should provide ready access to stairways and permit rapid circulation to every part of the building; fireproof construction, hard maple upon concrete floors; in elementary schools 12 feet wide, others not less than 8; corridors should be free from lockers or other obstructions; basement should not descend more than 3 feet below grade, except for heating and ventilating plant; should be 12 feet high; ratio between window and floor area 25 per cent.; heating and ventilating systems should be separated from the rest of the floor by masonry walls and automatic fireproof closing doors; masonry wall should divide girls' and boys' toilets and baths.

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*Copies of the complete detailed standards for judging school buildings, by Dr. George D. Strayer, may be obtained from the Bureau of Publications, Teachers College, Columbia University, New York City.

SOME STANDARDS FOR JUDGING SERVICE SYSTEMS

Heating and ventilating; direct and indirect plenum-exhaust system preferred; air supply source from top of building; standard 2000 cubic feet per hour per pupil; humidity 40 to 60 per cent.; inlets 8 to 9 feet above floor in classrooms; outlets near the floor, both without grills; automatic thermostat control; separate exhaust fans for toilet rooms.

STANDARDS FOR FIRE PROTECTION

Standard standpipe system, with no part of building more than 75 feet distant from nearest hose outlet; one fire extinguisher to every 5000 square feet of floor area, re-charged annually; fire-alarm stations on each floor in plain sight; encased fireproof stair-wells, with doors opening upon them at floor levels, are the standard fire-escapes; fire doors and partitions at all places of probable danger; fire glass windows only should be permitted below or overlooking fire-escapes; exit lights and hall arrows for fire exits are necessary.

STANDARDS FOR CLEANING SYSTEM

A vacuum system, with permanent piping, so that every part of the building is not more than 50 feet from a hose outlet.

STANDARDS FOR ARTIFICIAL LIGHTING

In classrooms 6 to 9 outlets; standard illumination 9 foot candles at each desk, without objectionable glare or shadows; semidirect or direct illumination preferred.

STANDARDS FOR WATER SUPPLY

One automatic bubbling fountain for 75 to 100 children; none in toilets; placed at varied heights; apparatus should prevent children from touching lips to the same; wash-bowls adapted to height of children, one for each 75 children; showers for both sexes; hot and cold water, towels, and liquid soap.

STANDARDS FOR TOILET SYSTEM

Toilet rooms should be accessible; one should be provided on each floor; separate toilets for the faculty, janitor, and for kindergarten children should be provided; standard, one seat for each 25 boys, one urinal stall for each 15 boys; one seat for each 15 girls; non-communicating, soundproof walls between adjoining rooms provided for the two sexes; partitions and swing doors for each seat; southern exposure desirable, with an abundance of natural light.

STANDARDS FOR CLASSROOMS

Fifteen square feet of floor space and 200 cubic feet of air space per child in the elementary schools; 22x 28x12 to 24x30x12 are standard sized rooms; floors cement, overlaid with battleship linoleum or hard wood,, walls are smooth, non-glass plaster, with the cement plaster for dado, avoiding grooves and ledges; built-in book-cases; blackboards varying in height to suit the size of children for each grade; walls light buff or very light green in color; ceiling white or extremely light cream; glass area one-quarter to one-fifth of floor area; unilaterally lighted on pupils' left; windows as near ceiling as possible, three and one-half to four feet from floor, plain glass; mullions not over 12 inches wide; front windows 7 feet distant from front wall; shades light sage color, adjustable from the center.

SPECIAL ROOM STANDARDS

Playroom, auditorium, study hall, library, gymnasium, swimming pool, and lunch room, with standard equipment; principal's office, teachers' rest room, nurses' room, and janitor's room, adequately equipped; laboratories, domestic science, manual training, and general science rooms in all grammar schools.

METHOD OF SCORING

Five members of the survey committee visited each building and after having surveyed the building and surroundings with respect to the items listed above, each man, scoring independently, judged each item, allotting to it a score in terms of the standards named. Table XXX, which gives the ratings allotted by each of the five judges to the several items in buildings Number One and Twenty-three, shows how the final rating for each building was obtained.

The final score, it will be noted, is the sum of the medians of the five scores allotted to each of the twenty-two secondary headings on the score card. The individual ratings given by each of the five judges on Building No. 1 were 436, 445, 443, 438 and 448. The total of the medians for the several items is 437, the final score allotted to the building. Similarly the individual ratings for Building No. 23 were 738, 735, 753, 728, and 741, while the composite of the medians was 744, which is the final score used in ranking the building. Table XXXI exhibits the school buildings of Paterson in order of rank from the lowest to the highest.

From Table XXXI it will be seen that twelve buildings are rated at less than 500 points out of a possible

TABLE XXX.

SAMPLE SCORES ON TWO PATERSON SCHOOL BUILDINGS

		Building No. 1							Building No. 23						
Scorer's Initial		Hm	T	B	E	Ha	Med		Hm	T	B	E	Ha	Med	
Item 1		72	70	70	60	68		67	115	107	112	110	100		109
	A	40	35	35	30	33	35		50	47	47	48	45	47	
	B	27	25	30	25	30	27		30	30	30	30	30	30	
	C	5	10	5	5	5	5		35	30	35	32	25	32	
Item 2		95	90	93	85	90		90	150	142	152	143	153		149
	A	20	14	15	17	21	17		22	20	22	22	22	22	
	B	35	38	35	30	38	35		58	51	56	53	57	56	
	C	40	38	43	38	31	38		70	71	74	70	74	71	
Item 3		86	82	83	93	66		78	165	174	168	175	191		178
	A	17	15	14	34	21	17		44	52	47	51	55	51	
	B	16	15	20	13	8	15		32	29	42	45	55	42	
	C	13	13	11	8	12	12		17	17	14	12	15	15	
	D	4	6	10	6	5	6		15	15	16	15	12	15	
	E	6	5	6	5	4	5		10	11	5	11	12	11	
	F	3	7	3	7	4	4		11	10	8	8	10	10	
	G	22	16	19	20	12	19		31	40	36	26	29	31	
	H	5	5	0	0	0	0		5	0	0	7	3	3	
Item 4		137	155	162	165	162		164	269	268	277	254	251		265
	A	25	20	24	25	25	25		35	35	35	35	35	35	
	B	48	55	54	53	54	54		86	83	91	80	81	83	
	C	30	40	50	51	57	51		75	78	78	70	65	75	
	D	5	5	0	15	0	5		25	25	25	25	25	25	
	E	29	35	34	21	26	29		48	47	48	44	45	47	
Item 5		46	48	35	35	62		38	39	44	44	46	46		43
	A	16	27	13	14	24	16		14	15	18	15	10	15	
	B	10	16	10	9	10	10		18	24	21	16	23	21	
	C	20	5	12	12	28	12		7	5	5	15	13	7	
Totals		436	445	443	438	448		437	738	735	753	728	741		744

Final score for Building No. 1 437

Final score for Building No. 23 744

1000. It is the recommendation of the committee that these buildings be abandoned for school purposes as rapidly as possible. The order of abandonment should be, in so far as it is consistent with the number of children involved, in the order of the scores as listed. Six buildings fall in the five to six hundred group, and

TABLE XXXI.

SCHOOL BUILDINGS OF PATERSON.

ARRANGED IN THE ORDER OF RANK OF THEIR FINAL SCORES

Building	Score
No. 2	318
No. 25	319
No. 6	376
No. 7	376
No. 11	391
No. 8	425
No. 1	437
No. 13	444
No. 4	450
No. 16	470
No. 5	477
No. 15	497
No. 18	519
No. 19	528
No. 14	548
No. 17	552
No. 20	589
No. 3	591
No. 9	703
No. 23	744
No. 26 H. S.	763
No. 12	775
No. 22	820
No. 24	829
No. 21	847
No. 10	919

should be extensively altered if they are to continue to be used over any considerable length of time. It is a noteworthy fact that there are no buildings in the six to seven hundred class. This gap in the scores marks the transition in Paterson from the old to the new conception of schoolhouse construction. It marks the beginning of a new conception of the community's educational obligation to its children. Six elementary schools and the high school fall in the seven to nine hundred class. Except for certain easily remedial factors, as playgrounds and special rooms in the case of some, all of these buildings are highly satisfactory.

Building No. 10. scoring 919 points, is a building of which the citizens of Paterson and the school officials may justly be proud. It is positive evidence that the community has recognized in the highest degree its obligation to its children. The four buildings 22, 24, 21, and 10, scoring 820, 829, 847, and 919 respectively, should form the nucleus of a school plant, the advantages of which should be extended to every child in the city.

Table XXXII shows the number and percentage of elementary buildings in Paterson falling within the given scores as compared with the same data for St. Paul and Omaha for which such data are available.

TABLE XXXII

CONVENIENT GROUPING OF FINAL SCORES IN THE LIGHT OF RECOMMENDATIONS.

	CITIES					
Final Scores	St. Paul Number	St. Paul Percent	Omaha Number	Omaha Percent	Paterson Number	Paterson Percent
901-1000	1	2	0		1	4
701-900	3	6	9	18	6	24
601-700	13	26	10	20	0	0
501-600	23	46	17	34	6	24
Below 500	9	18	16	32	12	48

It will be noted from Table XXXII that 48 per cent. of Paterson's buildings are below 500 as compared with 32 per cent. for Omaha and 18 per cent. for St. Paul. Thus by comparison Paterson is conspicuous for her high percentage of extremely poor buildings. At the same time the city may take commendation unto itself for its relatively high percentage of good buildings, having 28 per cent. in the class above 700 as against 9 per cent. for Omaha and 6 per cent for St. Paul. This fact again points out that Paterson has already accepted the new obligation of educational responsibility.

In order that the exact item upon which any given building received a low score may be readily observed, Table XXXIII is given here.

From this table it will readily be seen that with respect to certain important items there has been a general practice of neglect in the Paterson school plant. Under Size and Form of Site, to which 40 points are allotted, the highest score is 35, and that in the case of but one building. Eleven buildings score 10 or less. Under Fire Protection, a factor so important in the judgment of school authorities as to be allotted 65 points, eighteen buildings score 17 points or less.

In order to give a comprehensive view of the situation with respect to some of the more important items and to provide a basis of comparison, Table XXXIV is given below.

TABLE XXXIII.

THE DETAILED FINAL SCORES ALLOTTED ALL PATERSON SCHOOL BUILDINGS ON THE STRAYER BUILDING SCORE CARD.

	Location	Drainage	Size & Form	Site	Placement	Gross Structure	Internal Structure	Building	Heating & Ventilating	Fire Protection	Cleaning System	Artificial Lighting	Electric Service	Water Supply	Toilet Facilities	Mechanical Service	Service Systems	Location & Connection	Construction & Finish	Illumination	Cloak Rooms & Wardrobe	Equipment	Class Rooms	Large Rooms for General Use	Rooms for School Officials	Special Service Rooms	Special Rooms	TOTAL
	A	B	C	I	A	B	C	II	A	B	C	D	E	F	G	H	III	A	B	C	D	E	IV	A	B	C	V	
*	55	30	40	125	25	60	80	165	70	65	20	20	15	30	50	10	280	35	95	85	25	50	290	65	35	40	140	1000
1	35	27	5	67	17	35	38	90	17	15	12	6	5	4	19	0	78	25	54	51	5	29	164	16	10	12	38	437
2	30	28	5	63	28	30	20	78	16	16	10	4	4	3	11	5	69	5	30	27	3	9	74	8	6	20	34	318
3	45	30	10	85	20	48	61	129	35	15	14	5	5	6	24	5	109	32	77	71	20	35	235	10	18	5	33	591
4	30	23	10	63	22	34	45	101	26	6	10	8	7	8	14	0	79	10	51	53	16	30	160	15	19	13	47	450
5	35	28	10	73	22	34	41	97	19	5	10	7	6	6	17	0	70	30	59	57	12	35	193	9	13	22	44	477
6	42	26	10	78	20	34	37	91	20	12	12	8	4	5	14	2	77	10	45	28	0	21	104	10	6	10	26	376
7	38	28	10	76	22	28	16	66	18	5	12	5	3	4	7	5	59	15	39	35	10	21	120	22	8	25	55	376
8	28	26	18	72	22	37	33	92	21	5	9	5	7	8	12	10	77	20	49	60	9	17	155	10	5	14	29	425
9	40	23	30	93	22	47	64	133	52	21	12	15	9	12	85	0	156	31	81	75	22	39	248	27	18	28	73	703
10	48	30	20	98	23	58	72	153	68	58	20	20	15	30	48	5	264	35	88	83	25	50	281	48	85	40	123	919
11	30	26	10	66	18	32	27	77	19	7	10	5	6	7	13	10	77	12	48	50	5	21	136	11	7	17	85	391
12	49	30	30	109	20	54	69	143	50	32	13	15	14	17	38	3	182	35	88	71	21	43	258	26	26	31	88	775
13	45	23	10	78	20	44	36	100	26	7	14	0	3	5	17	10	82	20	62	42	10	23	157	15	7	5	27	444
14	45	30	30	105	25	32	45	102	20	10	13	1	4	7	42	10	107	31	56	53	15	18	173	33	3	25	61	548
15	38	26	15	79	17	42	50	109	23	17	10	8	9	9	13	0	89	25	61	55	18	23	182	9	14	14	37	497
16	42	26	20	88	19	40	36	95	17	11	12	8	6	6	19	0	79	20	57	58	12	24	171	10	10	17	37	470
17	47	28	25	100	20	41	48	109	29	11	12	5	5	12	23	10	107	20	65	56	15	22	178	20	15	23	58	552
18	50	28	20	98	25	41	45	111	16	5	16	5	5	12	13	0	75	30	61	45	3	16	155	34	15	34	83	519
19	45	30	12	87	22	43	40	105	22	9	10	4	4	5	11	10	75	30	61	61	15	26	193	27	12	29	68	528
20	45	30	25	100	22	52	58	132	25	10	15	2	7	6	14	10	89	35	74	57	15	28	209	16	18	25	59	589
21	55	30	30	115	25	51	70	146	65	32	17	17	12	26	45	5	219	35	89	75	22	45	266	38	28	35	101	847
22	53	30	40	123	25	57	80	162	55	37	18	12	6	11	33	10	182	35	85	77	20	46	263	25	30	85	90	820
23	47	30	32	109	22	56	71	149	51	42	15	15	11	10	31	3	178	35	83	75	25	47	265	15	21	7	43	744
24	55	30	35	120	22	56	75	153	56	43	17	18	10	11	35	3	193	35	92	75	25	49	276	40	30	17	87	829
25	20	10	5	35	14	24	18	56	13	8	5	0	4	3	5	10	48	15	54	55	5	17	146	13	0	21	34	319
26	47	30	10	87	25	56	63	144	50	37	14	17	13	15	44	4	194	35	84	63	10	48	235	43	23	87	103	763

*On this line are given the maximum possible scores on each item.

TABLE XXXIV

PERCENTILE DISTRIBUTION OF THE ELEMENTARY SCHOOL BUILDING OF PATERSON, OMAHA, AND ST. PAUL WITH RESPECT TO THE ADEQUACY OF CERTAIN IMPORTANT FEATURES.

	0% to 25%						26% to 50%						51% to 75%						76% to 100%					
	Pat.		Omaha		St. Paul		Pat.		Omaha		St. Paul		Pat.		Omaha		St. Paul		Pat.		Omaha		St. Paul	
	No. of Bldgs.	Per cent. of Bldgs.	No. of Bldgs.	Per cent. of Bldgs.	No. of Bldgs.	Per cent. of Bldgs.	No. of Bldgs.	Per cent. of Bldgs.	No. of Bldgs.	Per cent. of Bldgs.	No. of Bldgs.	Per cent. of Bldgs.	No. of Bldgs.	Per cent. of Bldgs.	No. of Bldgs.	Per cent. of Bldgs.	No. of Bldgs.	Per cent. of Bldgs.	No. of Bldgs.	Per cent. of Bldgs.	No. of Bldgs.	Per cent. of Bldgs.	No. of Bldgs.	Per cent. of Bldgs.
Heating & Ventilating System	5	19.2	8	15.4	3	5.7	13	50.	24	46.2	36	67.9	4	15.4	8	15.4	11	20.7	4	15.4	12	23.	3	5.7
Fire Protection System	17	65.3	36	69.2	29	54.7	4	15.4	10	19.2	16	30.2	4	15.4	3	5.8	4	7.5	1	3.8	3	5.8	4	7.5
Toilet System	5	19.2	4	7.7	1	1.9	12	46.2	20	38.5	7	13.2	4	15.4	19	36.5	29	54.7	5	19.2	9	17.3	16	30.2
Water System	13	50.	28	53.9	24	45.2	10	38.4	21	40.4	22	41.5	1	3.8	2	3.8	4	7.5	2	7.7	1	1.9	3	5.7
Large Rooms for General Use	14	53.8	41	78.8	5	9.5	6	23.1	8	15.4	41	77.3	5	19.1	2	3.8	7	13.2	1	4.	1	1.9	0	0
Cleaning System	1	3.8	1	1.9	0	0.	7	26.9	16	30.8	9	16.9	13	50.	34	65.4	29	54.7	5	19.2	1	1.9	15	28.3
Artificial Lighting System	12	46.2	17	32.7	28	52.8	6	23.1	22	42.2	16	30.2	4	15.4	13	25.	8	15.1	4	15.4	0	0.	1	1.9
Internal Structure	3	11.5	6	11.6	1	1.9	7	26.9	12	23.2	15	28.3	7	26.9	25	48.	26	49.1	9	34.7	9	17.3	11	20.7
Gross Structure	0	0.	2	3.8	1	1.9	3	11.5	9	17.4	7	13.2	13	50.	20	38.5	30	56.6	10	38.4	21	40.4	15	38.3

Under the percentage ranges 0 to 25 per cent., 26 to 50 per cent., 51 to 75 per cent., 76 to 100 per cent., the number and per cent. of buildings falling within each range is given for Paterson, Omaha, and St. Paul. It will be observed that with respect to fire protection 17 buildings, or 65.3 per cent., fall in the range of 0 to 25 per cent., meaning that 65.3 per cent. of the Paterson buildings received less than 25 per cent of the possible score. Upon this same item Omaha shows even a larger percentage, 69.2 per cent., falling within this same low range. St. Paul has 54.7 per cent. of its buildings in this class. The facts given in this table are deserving of the most careful study in connection with any plans for the repair and alteration of buildings.

SCHOOL BUILDING SITES

The figures given in Table XXXV are abundant proof of the extremely short-sighted policy of the city of Paterson in providing adequate school sites. The playground area, measuring all space not actually occupied by the building, ranges from .4 of a square foot to 49.4 square feet per child. The median number of square feet per child is 15.2. When one considers that in the opinion of authorities on playground facilities 100 square feet per child is the minimum acceptable standard, the condition in Paterson stands out as all the more deplorable. It is the recommendation of the committee that immediate steps be taken to enlarge, where possible, the playgrounds of all buildings that are to continue to be used over any considerable period of time and of old buildings that are to be replaced by new ones.

TABLE XXXV.

PLAYGROUND AREA PROVIDED IN ELEMENTARY SCHOOLS—DISTRIBUTED BY BUILDINGS.

School Building	Playground Area of Site not Occupied by Building	Enrollment	Playground Area per Child
1	280 sq. ft.	641	.4 sq. ft.
2	7000	546	12.8
3	8310	797	10.4
4	640	1271	.5
5	10496	857	12.2
6	3950	1184	3.3
7	7600	320	23.8
8	7712	391	19.7
9	23770	1204	19.7
10*			
11	8221	458	17.9
12	44966	1357	33.1
13	7348	707	10.4
14	18000	461	39.
15	10646	946	11.3
16	9456	655	14.4
17	5865	467	12.6
18	13695	581	23.6
19	7894	520	15.2
20	612	415	1.5
21	29889	958	31.2
22	6745	367	18.4
23	21900	925	23.7
24	38664	782	49.4

Table XXXVI shows the percentage of children in each of six cities that has the various designated playground areas. From this table it is obvious that with reference to play space the children of Paterson are less well provided for than any of the cities named. One hundred per cent. of the children have less than half the standard provision.

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*Because of contemplated additions figures are not given for this school.

TABLE XXXVI.

PLAYGROUND SPACE PROVIDED IN THE ELEMENTARY SCHOOLS OF SIX CITIES.

PERCENTAGE OF CHILDREN IN ELEMENTARY SCHOOLS HAVING PLAYGROUND SPACE AVAILABLE OF

	30 sq. ft. or less	30 sq. ft. to 100	100 sq.ft. or less	100 sq.ft. to 200	200 sq. ft. or over
	Percent. of children	Percent.of children	Percent.of children	Percent.of children	Percent.of children
St. Paul—1917	29.1	56.1	85.2	9.9	4.9
Denver—1916			82.0	12.5	5.5
Salt Lake City —1915			37	32	31
Omaha—1917	9	49	58	32	11
Paterson—1918	78.8	21.2	100	0	0
Milwaukee—1916	39.3	49.7	89	9.5	1.5

GROSS AND INTERNAL STRUCTURE

The buildings receiving low scores on gross and internal structure belong to the type of construction that apparently prevailed in Paterson previous to 1905. In these buildings there is little or no recognition of standards. They are of the block type, more than two stories in height, with inadequate entrances poorly placed and in many cases obstructed. The stairways are of wooden construction and so arranged as to become easily congested in case of panic. A great many of the stairways are full-length runs, without intermediate landings. Since but one of these buildings is equipped with fire-escapes, the condemnation of the stairways and corridors is all the more justifiable. The lighting of stairways and corridors in these buildings is extremely poor. In a number of them artificial light is used on the brightest days, and in still others it should be. The basement space in these buildings is poorly adapted for school use. The school officials are to be commended for their fairly successful effort to convert parts of them into passably good rooms. Due to the fact that all of these buildings fall into the class scoring below 500, it is inadvisable to attempt to correct these faults of construction. There is but one solution of the problem and that is to gradually replace them with modern buildings.

SERVICE SYSTEMS

HEATING AND VENTILATING

Owing to the fact that the building survey was made during the late spring, it was impossible to measure the adequacy of the heating and ventilating plant when working under full load. The committee found it necessary to judge efficiency on the basis of the kind and installation of the heating and ventilating systems. On this basis 18 out of 26 buildings, 69 per cent., scored less than 35 points out of a possible 70.

The absence of forced ventilation in many buildings, the failure to provide separate heating ducts for each classroom, the lack of thermostatic control and humidifiers, the location of the air-supply source on the ground level, and the failure to provide separate ventilation for toilet rooms, accounts for many of the low scores. It is the recommendation of the committee that in all new construction more careful consideration be given to the problems of heating and ventilating. In a large majority of the buildings the windows are depended upon entirely for supplying fresh air. Owing to the uncertainty of attention and regulation this method of ventilation is very unsatisfactory. At the time of the survey many of the classrooms were closed tight and the air was extremely foul-smelling and objectional. In buildings where windows are to be the means of ventilation it is recommended that definite provision be made for regulation and control.

FIRE PROTECTION

With respect to no other single item of the school plant is Paterson subject to so severe a condemnation as upon her failure to safeguard the lives of her children against death through fire or panic. Sixty-five and three-tenths per cent. of all of the buildings scored less than 25 per cent. of the 65 points allotted to this item.

From Table XXXVII it will be seen that more than half of the buildings are more than two stories high; that in the entire city there is but one fire-escape; that in 9 buildings it requires three minutes or longer to empty the building under well-ordered fire drills; that there are but 18 hose-reels in the school plant, 17 of which are in one building; that 15 buildings have no fire-extinguishers; and that there are but 22 exits equipped with panic bolts, 14 of those being in one building. Where fire-extinguishers were found they were useless, not having been recharged since they were installed, in some cases as much as twenty years

TABLE XXXVII

FIRE PROTECTION, APPARATUS AND EQUIPMENT IN ELEMENTARY SCHOOL BUILDINGS

No. of Schools	Height of Bldg.	No. of Fire Escapes	Median Time to Empty Bldg.	No. Hose Reels	No. of Fire Extinguishers	No. of Exits	No of Exits with Panic Bolts	No. of Fire Drills in March
1	4	0	3.00	0	0	3	0	5
2	3	1	1.40	0	3	6	1	2
3	2	0	2.30	0	0	5	0	2
4	3	0	3.00	0	0	5	0	3
5	3	0	4.30	0	0	4	0	3
6	3	0	3.00	0	7	5	0	2
7	3	0	2.00	0	0	3	0	1
8	2	0	1.20	0	5	3	0	3
9	3	0	2.30	0	1	10	0	1
10	3	0	3.00	17	0	14	14	2
11	2	0	2.00	0	8	3	0	1
12	3	0	3.20	0	0	10	0	4
13	2	0	0.55	1	4	7	0	3
14	2	0	1.00	0	0	4	2	1
15	2	0	3.30	0	0	4	0	2
16	3	0	1.45	0	0	4	0	1
17	2	0	2.30	0	7	3	0	2
18	2	0	2.15	0	0	5	0	2
19	2	0	1.30	0	6	4	0	2
20	2	0	2.30	0	3	5	0	1
21	3	0	2.00	0	0	5	2	2
22	2	0	1.40	0	0	3	3	2
23	3	0	3.00	0	0	3	0	1
24	3	0	4.00	0	0	3	0	1

ago. In all but the more recent buildings boiler rooms are not separated from the rest of the building. There are no fire doors or partitions. The overhead in the boiler rooms is of wood, scantily protected immediately over the boiler by sheet metal, but open and exposed at all other points. Eighteen buildings have wooden stairways and are of non-fireproof construction throughout. Under the specifications of the Building Code of the State Board of Education all of the 18 buildings scoring less than 700 points are liable to condemnation on the basis of fire risk alone.

The committee recommends that all buildings that are two stories or more in height, not equipped with fireproof stairways, that are to be continued in service shall be equipped with fire-escapes that meet the requirements of the State Building Code.

CLEANING SYSTEM

School No. 10 was the only building making a perfect score on this item. Provisions for vacuum cleaning have been installed, and every facility provided for keeping the building in a sanitary condition. With few exceptions the janitor service was as good as the system of cleaning would permit. It would be a profitable investment for the city of Paterson to offer a course in the training of school janitors. It should include the fundamental principles of sanitation, fire hazards, economy of fuel, and supplies.

ARTIFICIAL LIGHTING

From Table XXXIV it will be seen that 46.2 per cent. of the buildings scored less than 25 per cent. of the possible maximum. Twenty-three and one-tenth per cent. registered between 26 and 50 per cent. of the possible allottment. Thus 69.3 per cent. of the Paterson plant is rated as less than 50 per cent. efficient in artificial lighting.

All modern school plants should be equipped for night service. Classrooms should be provided with from six to nine outlets, types of fixtures should be standardized and purchased in quantities, and the offices, teachers' rooms, rest rooms, and janitors' quarters should be lighted to permit work after school hours.

WATER SUPPLY SYSTEMS

The median score in the twenty-six school buildings of Paterson was seven points out of a possible thirty. Eighty-eight and four-tenths per cent. of the plant scored less than 50 per cent. of the allotted points. From these figures it is evident that no serious consideration has been given to the important problems of supplying school children with plenty of water for all purposes. The separate problems considered were drinking facilities, provision for washing, and bathing.

DRINKING FACILITIES

TABLE XXXVIII

COMPARISON OF DRINKING FACILITIES OF THE ELEMENTARY SCHOOLS OF PATERSON, OMAHA, ST. PAUL AND DENVER.

	1 Paterson		2 Omaha		3 St. Paul		4 Denver	
No. of Children per Fountain	No. of Bldgs.	Percent. of Bldgs.	No. of Bldgs.	Percent. of Bldgs.	No. of Bldgs.	Percent. of Bldgs.	No. of Bldgs.	Percent. of Bldgs.
Less than 25	0	0	3	6.4	0	0	3	6.2
25 to 49	7	29.2	21	44.7	9	16.6	12	22.2
50 to 74	7	29.2	10	21.3	9	16.6	22	40.6
75 to 99	4	16.6	5	10.6	3	6.2	5	9.2
100 to 124	1	4.2	2	4.2	5	9.2	2	3.6
125 to 149	1	4.2	0	0	1	1.8	5	9.2
150 or over	4	16.6	6	12.8	15	27.7	5	9.2
Percent. of Bldgs. Standard or Above	58.3		72.4		33.2		69	
Percent. of Bldgs. Below Standard	41.7		27.6		67.1		31.2	

Standard One Fountain for 75 Children.

1. 1918 2. 1917 3. 1917 4. 1916

On the basis of the number of bubblers installed Paterson has made a commendable effort to meet standard requirements. In comparison with Omaha, St. Paul, and Denver, Paterson is better supplied than St. Paul, but not so well as Omaha or Denver. The type of bubbler adopted is, however, unfortunate. It offers little or no advantage in sanitation and protection over the old 'community drinking cup.' The children when drinking take the ball of the bubbler into their mouths, and the flow of water, when not in use, is not sufficient to cleanse the bubbler for the next child. The mistake of locating all of the fountains in the playrooms of the basement has been made in most of the buildings. A generous number should be so placed, but two or more should be located at convenient places on each floor of every building. Children should drink an abundance of pure water, and it should be made easy as well as possible for them to do so. It is the recommendation of the committee that a new type of bubbler, one which will not permit the child's lips to come in contact with the metallic parts, be adopted and that a better distribution be made.

WASHING AND BATHING

The placing of wash bowls and shower baths in public school buildings has passed the experimental stage in America and has now come to be recognized as essential to standard equipment. In buildings large enough to justify the outlay, where the number of pupils served is great enough to make the cost sufficiently low, the swimming pool is highly desirable. In addition to the built-in equipment a generous supply of soap and paper toweling should be provided.

Table XXXIX presents the situation found in Paterson.

TABLE XXXIX.

FACILITIES FOR WASHING PROVIDED FOR CHILDREN IN THE ELEMENTARY SCHOOLS OF PATERSON

Number of Children per Wash Bowl	Paterson Number of Schools
50 or less	1
51 to 100	2
101 to 150	3
151 to 200	5
201 to 300	5
300 or over	7
Unprovided With Washing Facilities	1 Seating 320 Children

Percentage of Children Who Share Wash Bowls With More Than	Paterson
100 Children	86.6
150 Children	71.8
200 Children	57.3
300 Children	35.9
Children with no washing facilities	1.8

It will be seen from this table that 57.3 per cent. of the children share one wash bowl with more than 200 other children. Assuming the washbowls to be in constant use, and allowing each child three minutes in which to wash, their regular turn at the bowl would come every second day. In the case of the 35.9 per cent. who share with 300 or more, their regular turn would come every third day. Three hundred and twenty children have no washing facilities whatsoever. In but two buildings, Nos. 10 and 21, has any attempt been made to provide bathing facilities. In these buildings the equipment is inadequate, there being but four and two showers respectively, but it is a hopeful suggestion of the recognition of responsibility.

It is the recommendation of the committee that in all future construction and in the present buildings that are to be used over any considerable period of time, adequate provision be made for washing and bathing. In addition to wash bowls, showers and swimming tanks for the older pupils, tub baths should be provided for all kindergarten rooms.

TOILET FACILITIES IN ELEMENTARY SCHOOLS

The median score on toilet facilities in the Paterson elementary schools was 17 points out of a possible 50. Nineteen and two-tenths of the buildings scored less than 25, and 65.4 per cent. scored less than 50 per cent. of the standard allotment. These figures are sufficient to establish the fact that this very important problem of schoolhouse construction has not received due consideration. The low scores are partly accounted for by the conditions which exist in the group of buildings erected previous to 1905. The practice up to that time was to build disconnected toilets and to equip them with the most unsanitary type of fixtures. In general, these outhouses are still in use. In some cases they are not connected with the city sewerage system, but depend upon open cess-pools. The janitors reported extreme difficulty in flushing during the colder months, weeks passing in some instances without the toilets being cleaned. In addition to the lack of possible sanitation the discomfort and inconvenience to the pupils is in itself sufficient to condemn the type of equipment found in these buildings. The committee recommends that the disconnected toilet rooms be abandoned as rapidly as is consistent with the building program adopted.

A further cause of low scores on toilet facilities is shown in Table XL.

TABLE XL.

PERCENTILE DISTRIBUTION OF THE ADEQUACY OF TOILET ACCOMMODATIONS IN PATERSON ELEMENTARY SCHOOLS

Percentage of Sufficiency	Number of Buildings having various percentages of Sufficiency		
	Toilet seats for Boys	Urinals	Toilet seats for Girls
0	0	0	0
1-10	0	6	0
11-20	0	0	0
21-30	0	0	0
31-40	1	3	0
41-50	4	3	3
51-60	6	4	0
61-70	2	0	1
71-80	2	2	7
81-90	2	1	2
91-100	2	2	3
101-125	3	0	0
126-150	1	0	2
151-200	0	0	2
Over 200	0	0	4
Total	23	21	24
Percentage of Buildings Below Standard	74	90	54

From this table it will be seen that 74 per cent. of the buildings are below standard in the number of toilet seats for boys, 90 per cent. in the number of urinals, and 54 per cent in the number of toilet seats for girls. The standard of sufficiency is one toilet seat for each 25 boys, one urinal for each 20 boys, and one toilet seat for each 15 girls. In addition to the inadequacy in numbers, the distribution is poor. Toilet facilities should be provided on each floor, and separate provisions should be made for teachers, janitors, and kindergarten children. In all new construction and alterations particular attention should be given to the standards established.

CLASS ROOMS

EQUIPMENT

In 16 of the elementary schools the classroom equipment was rated at less than 50 per cent. efficient. The same condition holds with respect to this feature that has been pointed out with respect to so many others. The newer buildings are highly satisfactory, while the older ones are deplorably bad. This obviously unfair distribution of educational advantages should not be permitted to continue. It is the obligation of the School Board and the duty of the citizens to bring about a more equitable state of affairs. The best is not too good; therefore the solution lies in bringing the low standard up.

From Table XLI it will be seen that only 50 per cent. of the rooms are equipped with adjustable seats and that 36.4 per cent. are provided with but one size of the non-adjustable type. A recent study in a large school system of the differences in height of pupils in the same grade points out in a startling degree the necessity for variation in the size of equipment to be installed in any single classroom. The facts are revealed in Table XLII.

TABLE XLI.

DISTRIBUTION OF CLASSROOMS ACCORDING TO THE TYPES OF SEATS AND DESKS

Types of Seats and Desks	Rooms	
	Number	Per cent.
Adjustable	229	50
Adjustable and Non-Adjustable	23	5.2
Non-Adjustable—Single		
One Size	56	12.7
Two Sizes	11	2.5
Three Sizes	3	.7
Non-Adjustable—Double		
One Size	105	23.7
Two Sizes	12	2.7
Three Sizes	4	.8

TABLE XLII.

DIFFERENCE BETWEEN SHORTEST AND TALLEST CHILD IN EACH GRADE

Rooms Equipped with Non-Adjustable Seats of One Size only.

Omaha, Neb., June 1917.

	Smallest Difference in any Room		Median Difference of all Rooms		Greatest Difference in any Room	
Grade	Boys	Girls	Boys	Girls	Boys	Girls
I	3"	2"	8 "	8.16"	19"	13"
II	3"	4"	8.05"	8 "	21"	14"
III	5"	2"	10.8"	8.6"	19"	19"
IV	6"	5"	9.8"	10.4"	15"	22"
V	1"	2"	9.7"	11 "	17"	17"
VI	6"	6"	11.2"	10.9"	17"	16"
VII	5"	4"	11.8"	11.5"	14"	15"
VIII	3"	4"	11.8"	8.1"	19"	12"

In 44 rooms the difference between shortest and tallest boy exceeded 12"
In 40 rooms the difference between shortest and tallest girl exceeded 12"
In 22 rooms the difference between shortest and tallest boy was less than 6"
In 27 rooms the difference between shortest and tallest girl was less than 6"

It is undoubtedly true that many of the physical defects acquired in school are due to such mal-adjustments as are shown here. For two girls differing in height by twenty-two inches to have to sit in the same sized seat cannot fail to produce ill effects. More than one-third of the children of Paterson are subjected to this sort of irregularity. Practically one-fifth of the children are using the old type of double seat and desk. This type of fixture is no longer found in any well-regulated school plant. It is the recommendation of the committee that the double seats be discarded as rapidly as possible and that where non-adjustable seats are used as many as two or three sizes be placed in each room.

BLACKBOARDS

In general, the classrooms of the Paterson schools are equipped with a splendid quality of slate blackboards. The installation, however, is bad. From Table XLIII it will be seen that in 64.7 per cent. of the cases the boards are too high for the most effective service.

SIZE AND SHAPE OF CLASSROOMS

An elementary classroom designed to accommodate forty pupils may vary in dimensions from 22x28x12 to 24x32x12. The standard number of square feet per classroom will vary from 616 to 768, and the standard number of cubic feet from 7392 to 9984. In smaller rooms children should be housed only on the basis of 15 square feet of floor area and 200 cubic feet of air

TABLE XLIII.

NUMBER OF BLACKBOARDS OF VARIOUS HEIGHTS FROM THE FLOOR IN THE DIFFERENT GRADES OF THE PATERSON SCHOOLS.

Those to the right of the heavy line, 64.7 per cent., are too high.

Inches	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
Kindergarten					2			3	3	3	7		2	2			3	1						
1st Grade	1				8	1	1	11	8	4	17		3	7			12			1			4	
2nd Grade					6	2		9	7	7	12	1	3	4			12	1			1	2	2	
3rd Grade	1	1						9	6	8	21	5	2	2			9		1			1	4	
4th Grade						2		6	4	4	19	8	5	7			8		3	2		2	4	1
5th Grade					1	1		10	5	4	17	7	5	3	1		2		1	2	1	1	1	
6th Grade								9	9		13	7	4	4			4		4					
7th Grade						2		7	2	7	11	6	2	5			6	1			1			
8th Grade	1						4	3		3	11	4	2	6			5							

All those to the right of the heavy line, 313, may be considered too high.

HEIGHTS OF PATERSON'S BLACKBOARDS

Grades	Median Heights	Average Heights	Maximum Heights	Minimum Heights
Kindergarten	29.8	29.7	37	24
1st Grade	29.7	30.5	42	20
2nd Grade	29.8	31.3	42	24
3rd Grade	30.0	30.5	42	20
4th Grade	30.9	32.3	43	25
5th Grade	30.1	30.7	42	24
6th Grade	30.2	30.8	38	27
7th Grade	30.4	30.8	40	25
8th Grade	30.3	30.5	36	20

Heights are given in inches.

space per child. Larger rooms are uneconomical, bring about voice-strain on the part of the teacher and eye-strain on the part of the pupils, and tempt administrators to enlarge classes beyond the maximum of 40 pupils. Data collected, giving the measurements of the length, breadth, and height of Paterson's classrooms indicate that the very great majority of the classrooms

TABLE XLIV.

DISTRIBUTION OF CLASSROOMS BY AREAS

Sqarue Feet	No. of Rooms
251—300	2
301—350	16
351—400	6
401—450	24
451—500	30
501—550	78
551—600	29
601—650	25
651—700	29
701—750	119
751—800	115
801—850	2
851—900	2
901—950	—
951—1000	1
1001—1050	—
1051—1100	—
1101—1150	—
1151—1200	—
1201—1250	—
1251—1300	—
1301—1350	—
1351—1400	1
1401—1450	—
1451—1500	—
1501—1550	—
1551—1600	1
1601—1650	—
1651—1700	1
Total	481

Median	702.2 square feet
Standard	616-768 square feet
Below Standard	191 Rooms or 39.5 per cent.
Standard	236 Rooms or 49.0 per cent.
Above Standard	56 Rooms or 11.6 per cent.

conform with the standard dimensions. Results are shown in Tables XLIV and XLV.

LIGHTING OF CLASSROOMS

A classroom should be lighted from the pupils' left only. From Table XLVI it will be seen that only 197 rooms are so lighted.

TABLE XLV.

DISTRIBUTION OF CLASSROOMS ON THE BASIS OF CUBICAL CONTENTS

Cubic Feet	No. of Rooms
4000 & below	15
4001—5000	25
5001—6000	25
6001—7000	99
7001—8000	47
8001—9000	66
9001—10000	169
10001—11000	26
11001—12000	4
12001—13000	2
13001 & above	3
Total	481

Median	844.8 cubic feet
Standard	7392-9984 cubic feet
Below Standard	177 rooms or 36.8 per cent.
Standard	269 rooms or 55.9 per cent.
Above Standard	35 rooms or 7.3 per cent.

Where classrooms are lighted from left and rear, teachers are required to cut off the rear light by the use of shades, or to face the glare. Eye-strain, headache, and irritablity result. In 141 classrooms this condition prevails. In 13 rooms all of the light comes from the rear. In these cases it is impossible for the teacher to regulate the situation. In 37 cases the children face the light from windows placed in the front of the room. It is the recommendation of the committee that these windows be closed up or permanently shaded. In all future construction the standards of lighting should be more strictly observed than has been the case even in the more recent buildings. A dead wall-space seven feet long should extend from the front

TABLE XLVI.

LIGHTING OF CLASSROOMS DISTRIBUTED BY BUILDINGS

	Number of Classrooms Lighted									
	From Left Only	From Left and Rear	From Right and Rear	From Left and Right	From Right Only	From Rear Only	From Three Sides	From Front Partly	With More than Half Light From Rear	From Over Head
School No. 1	4	13	0	0	0	0	0	0	3	0
School No. 2	0	5	5	3	2	0	0	2	2	0
School No. 3	11	11	0	0	0	0	0	0	0	0
School No. 4	15	6	0	0	4	0	3	1	0	0
School No. 5	6	10	3	0	1	3	0	1	6	0
School No. 6	2	4	3	0	2	4	5	1	4	0
School No. 7	4	4	1	0	0	0	0	0	2	0
School No. 8	0	5	4	0	0	0	0	1	0	0
School No. 9	18	4	0	0	0	2	1	1	4	0
School No. 10	38	2	0	0	0	1	0	0	1	0
School No. 11	4	2	0	0	0	0	4	2	0	0
School No. 12	32	0	0	0	0	0	1	1	0	0
School No. 13	3	8	1	0	1	0	4	5	2	0
School No. 14	0	5	3	0	0	0	4	4	3	0
School No. 15	7	7	5	1	1	0	0	1	4	0
School No. 16	1	6	2.	0	0	0	2	9	1	0
School No. 17	0	8	0	0	0	0	4	4	3	0
School No. 18	9	8	0	0	0	0	0	1	2	0
School No. 19	0	13	0	0	0	0	0	0	4	0
School No. 20	0	0	9	0	0	1	0	3	1	0
School No. 21	23	6	0	0	0	0	0	0	3	0
School No. 22	10	2	0	0	0	0	0	0	1	0
School No. 23	10	12	0	0	0	2	0	0	8	0
School No. 24	0	0	6	0	18	0	0	0	3	0
Total	197	141	42	4	29	13	28	37	57	0

wall of a classroom to the first window on the left. Children may then look at the front of the room from any seat and not be compelled to face the light The windows should extend to the rear of the room in one complete bank of light, the mullions not exceeding twelve inches in width. In height the windows should rise

TABLE XLVII.

RELATIONSHIP OF WINDOW AREA TO FLOOR SPACE DISTRIBUTED BY ROOMS

Window Area to Floor Space	Number of Rooms	Per cent. of Rooms
4%	2	.4
5%	—	—
6%	—	—
7%	6	1.2
8%	5	1.1
9%	7	1.5
10%	7	1.5
11%	20	4.3
12%	12	2.5
13%	7	1.5
14%	32	6.9
15%	38	7.9
16%	40	8.3
17%	57	11.8
18%	44	9.2
19%	37	7.7
20%	12	2.5
21%	72	15.0
22%	30	6.5
23%	8	1.6
24%	11	2.4
25%	22	4.6
26%	5	1.1
27%	2	.4
28%	1	.2
29%	1	.2
30%	—	—
31%	1	.2
32%	—	—
33%	—	—
34%	1	.2
35%	—	—
36%	1	.2

Total number of rooms listed	463
Total number of rooms with less than 20% window area to floor space	300
Percentage of rooms with less than 20% window area to floor space	64.8

from a few inches above the tops of the desks to as near the ceiling as construction will permit. The high window permits light to reach the farther and darker side of the room. All window shades should be light buff in color and hung so as to permit of being drawn either over the upper or lower part of the window sep-

TABLE XLVIII

WINDOW AREA TO FLOOR SPACE EXPRESSED IN PERCENTAGES DISTRIBUTED BY SCHOOLS

	Highest Percentage in any Room	Median Percentage in Building	Lowest Percentage in any Room
School No. 1	25	16	8
School No. 2	25	18	4
School No. 3	25	18	9
School No. 4	31	17	11
School No. 5	26	19	10
School No. 6	26	13	8
School No. 7	24	22	10
School No. 8	19	19	18
School No. 9	22	17	12
School No. 10	36	21	21
School No. 11	34	16	11
School No. 12	25	16	15
School No. 13	20	14	7
School No. 14	22	17	17
School No. 15	27	20	11
School No. 16	21	18	14
School No. 17	21	21	19
School No. 18	22	17	7
School No. 19	25	25	7
School No. 20	18	18	12
School No. 21	22	17	15
School No. 22	24	14	14
School No. 23	21	17	14
School No. 24	23	15	15

arately. In a very large per cent. of the classrooms in Paterson the shades are of very poor quality and poorly hung.

The window area in a classroom should be 20 to 25 per cent. of the floor space. From Table XLVII it will be seen that the 20 per cent. ratio is met in but 64.8 per cent. of the cases. In a number of rooms the light area is so extremely low as to justify their abandonment for school purposes. The median ratio for the city is 17. Further construction and alteration should tend to improve this condition.

LIGHT CONDITIONS IN THE PATERSON SCHOOLS AS SHOWN BY PHOTOMETRIC MEASUREMENTS

The light upon the children's desks in the same room and upon the blackboards in different rooms varies widely, though the average person does not notice this difference. This variation becomes prominent when the illuminometer indicates that while one desk is receiving, for example, seven foot-candles, another desk in the same room is receiving three hundred and thirty-three foot-candles of light. Since statistics advise us that 10 per cent. of children in the schools of the United States have defective vision, it is important that the efficiency of the illumination in classrooms be considered. By means of the illuminometer it is possible to measure accurately how many foot-candles illumination any surface receives. Most illuminating engineers consider the following conditions the minimum permissable:

Reading and writing		2.5 foot-candles
Drawing, sewing, etc.		5.0 foot-candles
Auditorium rooms	1 to	3.0 foot-candles
Corridors	.25 to	1 foot-candles

About six rooms, including the darkest, average, and brightest, in every school in Paterson were measured, and in only very few cases was the illumination found to be less than 2.5 foot-candles. This. however, does not mean that the illumination conditions are entirely satisfactory.

TABLE XLIX

RECORD OF PHOTOMETRIC READINGS IN THE PATERSON SCHOOLS

Number of Rooms in Which the Ratio of Light on the Darkest Desk and Brightest Desk to Light on Window Sill Was Found to be:

Building	Less than 1 %		1 to 5 %		6 to 10 %		11 to 15 %		16 to 20 %		21 to 25 %		Over 26 %	
	D	B	D	B	D	B	D	B	D	B	D	B	D	B
H. S.			9	2	2	4			1	2		1		3
No. 1			3				1	1	1					4
No. 2			4		1									5
No. 3			2		2	2	1							3
No. 4			3			1	3							5
No. 5	2		3		1	1				1		2		2
No. 6	4		1		1			1						5
No. 7			4							2				2
No. 8			2		2									4
No. 9			4		2							2		4
No. 10			2		4							1		5
No. 11			4											4
No. 12			6					2	1	2		1		2
No. 13	2		3			1								4
No. 14	2		1		1	1	1	3						1
No. 15	3		2		1			2		1				3
No. 16			3		2	1						2		2
No. 17	1		5			1		1		3				1
No. 18	1		4			1								4
No. 19	1		4			1			1			1		4
No. 20			3				1			2			1	3
No. 21			5							2				3
No. 22			3		1		1					1		4
No. 23			3		1		1			1				4
No. 24			4		1			1						4
No. 25			1											1
Total	16		88	2	22	14	9	11	4	16		11	1	86

B.—Brightest Desk
D.—Darkest Desk

It is necessary to have not only sufficient foot-candles, but also not too great a contrast between the light at the window and that at the desk. In each room that was measured, the illumination was tested at the window and at the brightest and darkest desk. The ratio between the light at a desk and at the window was computed in each case, and in no less than sixteen instances it was found to be one to a hundred. It is obvious that looking from a light at a desk to light one hundred times as intense at the window necessitates rather severe accommodation processes. The following table gives the ratios found in the various buildings.

In cases where the side of the room distant from the windows has insufficient illumination, ribbed glass should be used as is done in some of the newer buildings. This will tend not only to correct the poor illumination, but also eliminate sharp shadows and excessive glare. Properly tinted walls will also aid in improving the illumination.

Probably one of the most serious lighting defects in the Paterson schools is the glare on blackboards. Where there is a window near the front of the room, the glare on the blackboard can be relieved somewhat if the shade of this window is drawn. However, this should not be done if it interferes seriously with the light on the desks. In rooms having a blackboard on the wall opposite the windows, writing should be done on it in preference to the front board.

SPECIAL ROOMS

It will be noted from Table XXXIV that 53.8 per cent. of the Paterson buildings scored less than 25 per cent. of the 140 points allotted to this item, that 76.9 per cent. scored less than 50% of the possible score, and that but one building scored above 75 per cent. This is obviously one of the great lacks in the Paterson school plant. But the realization of this lack is already evidenced in the splendid facilities of School No. 10. The committee recommends that this type of building, with its auditorium, manual training and domestic science rooms, playrooms, gymnasium, printing room, and clinic, be extended to every section of the city of Paterson.

THE MEASUREMENT OF THE ACHIEVEMENT OF CHILDREN IN COMPOSITION, HANDWRITING, SPELLING, ARITHMETIC, LANGUAGE AND READING.

INTRODUCTION

1. The tests—when and to whom given.

The tests upon which are based the tables and recommendations of this chapter relative to the achievement of the pupils in the elementary schools of Paterson were given between March 14th and April 10th, 1918. This was late enough in the year to fairly represent the year's results and make them comparable with those from other surveys. Every grade and every child in the elementary schools, except those in the disciplinary school, was tested in one or more of the subjects.

2. Cooperation of the teachers.

The surveyors at all times met with the heartiest professional cooperation from the teachers, which aided materially in getting the desired data for this study.

The irregularity in the numbers tested in each grade is due to (1) irregularities in size of grades making the selection of six classes vary as much as forty-five pupils; (2) epidemics of measles which reduced the numbers in some classes over half; and (3) the occasional omission of a room by some surveyor for various reasons.

3. Selection of schools to be measured.
   a. The very limited funds available made it impossible to test all the children of all the grades.
   b. The selection was made of rooms rather than buildings.
   c. The number of tests to be given in any grade was determined, after which a *random* selection of rooms was made to secure that number.
   d. The schools are designated by a letter code in the tables in this section. The code has been placed in the hands of the Superintendent of Schools that teachers and principals may, if they desire, be informed regarding the rating of their own grades and schools.

4. Subjects measured.

The subjects selected for measurement were largely determined by the following considerations:

a. Subject-matter which permitted of tests of fundamental ability.

b. Bases for comparison in other cities.

c. Time at the disposal of the surveyors for giving and scoring the tests.

d. Cost of material.

e. Lack of adequate tests in some subjects not tested.

The following tests were given:

a. Composition—all grades above third.

b. Handwriting, formal and from compositions selected by rooms from grades above the second.

c. Spelling, selected rooms from grades above the second.

d. Arithmetic: Woody, selected rooms from third, fourth, fifth, and seventh grades.
Stone Reasoning Test, selected rooms from sixth and eighth grades.
Courtis Fundamentals, selected rooms from eighth grades.

e. Completion Test-Language Scales, Trabue, selected rooms from grades above the first.

f. Reading, Alpha 2, Thorndike, selected rooms from grades above the third.

USE TO BE MADE OF FINDINGS

To show how Paterson stands in comparison with other cities in achievement in the different studies is only one, and not the most important, of the purposes of this section of the survey. Another is the use which may be made by the supervisors and teachers in Paterson of the information gathered. It will show certain conditions to exist in certain buildings or rooms which, when known by those responsible, can be further studied and remedied. The same or similar tests can be given by the teachers or principals and the distribution of any particular class determined, after which the work can be adjusted to the individual needs of the pupils.

GENERAL SUMMARY OF FINDINGS

ENGLISH COMPOSITION

The study of the ability of the pupils in Paterson to use English in written composition resulted in the following conclusions:

(1) The general achievement of Paterson is decidedly below established standards and also below the achievement of most of the cities having comparable data, Paterson ranks almost at the lower end of the list for each grade.

(2) The gradation of abilities of the grades and divisions of grades is very irregular. In three out of five grades the B division does better than the A. The difference between the median accomplishment of grades (—.08, +1.38, —.63 +.79, +.19, +.25, —.06, +.70, +.18), is too irregular to show accurate grading.

(3) The variability in ability to write compositions within any one room is also very great. In only two

rooms are the pupils included within two steps on the scale, and in all the others the variation is 3, 4, 5, or 6 steps.

(4) The variations betwen rooms of the same grade range from .61 of a step in the 8A classes to 2.15 steps in the 4A classes. This condition calls for closer supervision between buildings.

HANDWRITING

The formal handwriting (that done primarily as a writing exercise) in Paterson is decidedly below that of other cities rated on the same scale and especially is this true of the work in grades 6, 7, and 8. The difference in accomplishment between the 3B grade and the 8A grade is 2.57 steps on the scale. The difference found within the same grades varies from 4 steps in 6A to 9 steps in 4B and 6B, so that children within any grade vary two or three times as much as between the entering third grade and the finishing eighth.

The handwriting as judged from the compositions is uniformly (with the exception of the eighth grade) inferior to the formal handwriting, showing that less care is used in the other written work than in the regular writing exercises. The speed of writing was very low in Paterson, and much more stress can be put upon that feature.

SPELLING

The spelling ability of the children in Paterson, as shown by the tests given and by the examination of composition papers, is not up to the standard of other cities. This is especially true in the intermediate grades. The work in the seventh and eighth grades is much better in the formal spelling exercises than it is in such other written work as composition.

More emphasis should be put upon the selection and teaching of words used in the "every day" written work of the pupils. The variations between rooms of the same grade and between pupils in the same room are very much too great, and call for closer supervision and more accurate promotion and classification.

READING

The silent reading of pupils in Paterson, as measured by Thorndike's Reading Scale Alpha 2, is in all grades below the standards set by Professor Thorndike, as well as the achievements of pupils in St. Paul, Minn., Nassau County, N. Y., and the Horace Mann School, New York. This is especially true of the seventh and eighth grades.

In most cases enough time is given to reading but too much emphasis is put upon oral reading and too little in reading for thought and appreciation. The quality of reading done is very good, except that not enough use is made of material of current interest as magazines and newspapers, nor is the city library used to any great extent.

It was also found in reading, as in the other subjects measured, that there was a very great variation not only between rooms of the same grade but also between children in the same rooms. Much improvement would result from a closer classification of pupils.

ARITHMETIC

The measurement of achievement in arithmetic of the Paterson pupils shows several significant facts, as follows:

(1) The differences in median achievements between B and A divisions are very irregular.

(2) A difference of from two to three years in school makes very little difference in ability in the fundamental operations.

(3) The work in the four fundamental operations is, generally speaking, of about the same quality and accuracy as the other schools measured. Better work is done, however, in addition and multiplication, than in subtraction and division.

(4) In reasoning ability in arithmetic, as shown by the Stone test, the children of Paterson are slightly below median ability.

(5 All the tests show that there is a very decided variation between median achievements of different rooms of the same grade.

(6) There is a much greater variation between the pupils within given rooms than is expedient for teaching purposes.

(7) There is too little practical application of arith-

metic to "everyday situations." These findings show clearly the need for a systematic regrading, for less emphasis on mechanical drill, and closer supervision between buildings.

LANGUAGE—COMPLETION TEST

The achievement of the Paterson pupils in language, as tested by the Trabue Completion Test, was shown to be very variable and below the achievements of other cities measured by the same test. Numerous children are allowed to progress into the intermediate grades who are unable to complete the simplest sentence. Every room has a very wide variation between the achievements of the children in that room. This variation extends from differences of 50 per cent. to 75 per cent. of the total test, which represents a greater difference within any one room than the difference between the median achievements of the second and the eighth grades. Because of its high correlation with other tests, the language test is often used as a test of general school ability. This makes the above variability within rooms even more significant.

GENERAL RECOMMENDATIONS

From a study of the results of the various tests given in Paterson to test the achievement of children in certain of the school subjects, some general conclusions are more or less obvious:

(1) In no subject tested does Paterson rank de-

cidedly above the established standards or the achievements of other cities, but in most cases it falls decidedly below these.

(2) The variations in achievement within any room are so great as to seriously interfere with adequate instruction, and call for sweeping reclassifications.

(3) The courses of study do not result in a progressive development of ability as the pupils pass through the grades. Because of undue emphasis at different periods, some B divisions are better than the A divisions of the same grade, and at places the progress made in the measured ability is three and four times as much in one grade as in others.

(4) The differences in median achievement of the same grades in different buildings is evidence of a lack of general supervision.

(5) An undue emphasis is put upon the formal elements of instruction, particularly in reading, arithmetic, and spelling.

The most extensive and helpful bibliography on the subjects of this section is to be found in the Seventeenth Year Book of the National Society for the Study of Education. A copy of this report should be in every principal's office.

ENGLISH COMPOSITION

Amount of Time Given to Composition.

According to the latest published course of study (1903), oral and written composition are taught either independently or in connection with other English subjects in every grade of the elementary schools of Paterson. The total amount of time per week in each grade devoted to the study of English (including reading, literature, phonetics, language, grammar, spelling, and composition) is, according to the same report, as follows:

MINUTES PER WEEK GIVEN TO ENGLISH

Grade	1	II	III	IV	V	VI	VII	VIII
Oral and Written Language	180	180	180	180				
Language and Grammar Oral and Written Language and Spelling					240	240	240	240
Literature	60	60	60	60	60	60	60	60
Reading	240	330	240	240	240	240	240	240
Totals	660	570	480	480	540	540	540	540
Salt Lake City	425	550	625	625	540	475	530	560

Paterson spends about the same amount of time in the study of English as Salt Lake City, which represents the average for the country. It is difficult to say how much of the total time devoted to English is spent in oral and written composition. An examination of the programs for twelve rooms shows that less than one-third of the time is so spent in these particular rooms. Probably this is true for the entire city. This is about the same as for other cities. Sufficient time is spent, therefore, if properly used, to produce excellent results.

Nature of the Course

According to the printed course of study, written composition includes the following required topics for each grade.

Grade I.

The writing of original sentences and short groups of related sentences based on the oral language work. Copying of short sentences and short groups of sentences within the comprehension of the child. The writing of the child's name, residence, and city. The correct use of capitals, periods, and question marks in the above. The abbreviations of *Mr.* and *Mrs.*

Grade II.

In addition to the above, the writing of the days of the week, months of the year, and the seasons. The correct use of the exclamation mark, and the abbreviations *St.* and *Ave.*

Grade III.

In addition to the above, the writing of short friendly letters, reproductions and compositions of a few simple sentences. The copying of stanzas of poetry. The arrangement of related sentences into short paragraphs. The correct use of the comma, apostrophe, and the abbreviations of proper names and possessives. Formation of the plural of nouns and the use of the terms *singular* and *plural, a* and *an,* and the distinction between vowels and consonants.

Grade IV.

In addition to the above, training the child to paragraph all written work, the use of possessives, adjectives, adverbs, adjective and adverbial phrases, predicate nouns, common contractions, and direct quotations. The writing of dates and addresses. The use of *this* and *that, these* and *those.* The abbreviations of the days of the week, of the months of the year, and *Dr., A. M., P. M.* Training the child to find and correct his own errors. The use of *has, have, had, has been, had been, shall, will, may, can,* and *must.* The use of the participle in phrases and adjectives.

Grade V.

In addition to the above, exercises in writing narration, description, reproductions, and in writing friendly letters. The arrangement of detached sentences into paragraphs. Simple rules for capitals, period, comma, quotation marks, and the apostrophe in possessives. Three degrees of comparison and the use of adjectives and adverbs in the predicate.

Grade VI.

The parts of a letter. The use and name of the following tenses: present, past and future. The formation of the principal parts of the following irregular verbs: *see, do, write, go, give, run, rise, speak, fly, have, grow, hide, break, be, lie, set.*

Grade VII.

In addition to the above, train the child to construct outlines. Teach business letters and forms. Teach the child to arrange paragraphs into simple themes.

Grade VIII.

Simple argument.

CRITICISMS AND SUGGESTIONS

Other phases are presented at the option of the teacher and supervisor. The course of study is designed merely to guide and unify the teacher's work. Observations of thirty-three teachers selected at random in four elementary schools show that the teachers are following the course of study in composition closely. Unfortunately the suggestions in the course are too meagre and confined almost entirely to the formal phases of English. English composition is treated rather incidentally. There should be a special syllabus prepared showing more elaborately, not only what phases of English composition should be taught in each grade, but how each phase should be taught.

ENGLISH COMPOSITION TEST

The following directions were given to the surveyors in order to secure uniform results in the giving of this test;

This test is designed for every grade from the fourth through the eighth. It is to be given to all the children of all the grades above the third.

Have each pupil provided with a sheet of the usual composition paper, pen, ink, and a blotter (if convenient). The pupils may use pencils if not accustomed to ink. Have each pupil record his name, age, grade and school at the top of his sheet. Place at the front of the room in view of all the pupils the card showing these items for which you ask. After these are obtained, have the teacher begin to fill out her section of the Test Record Sheet.

Then explain to the children as follows:

"I want to find out today how interesting a story you can write when you try your very best. Tell me in this composition what you would like to do next Saturday. This is the subject (Hang up the card, "What I Should Like to do Next Saturday." at this point so that every child can see it). You may use both sides of the paper if you wish. Are there any questions?"

Answer any questions briefly and pleasantly.

Continue your directions as follows: "I want you all to begin at the same time and to stop exactly when I tell you to. Now we are all ready. Let us see how interesting a story we can write. You may go to work."

Allow *exactly* 20 minutes for the writing of the compositions.

Then say: "You may all stop writing and put down your pens." Collect the papers immediately. In taking up papers in rooms where some pupils have not finished their work, it is well to remark pleasantly that they have at least written enough to show us whether or not they are going to have a good time next Saturday.

The examiner should then fill out his part of the Test Record Sheet. The papers from any given room should be tied up with string, the Test Record Sheet resting on top of the package. It is important that string be used, and that the records from each room be kept separately.

A sample of the Test Record Sheet is here shown.

TEST RECORD SHEET

To be filled out by the teacher.

City .... School ....

Grade .... No. of pupils enrolled ....

No. of pupils taking test .... Date of test ....

Names of pupils who for any reason may not do themselves justice in this test. (Illness, late entrance, or other causes).

Name .... Cause ....

....

....

....

....

....

Remarks about the class as a whole ....

....

....

Name of teacher ....Room No..........

* * * * * * * * * * * *

To be filled out by the examiner.

Name of test ....

Time allowed.......... Test began at.......... closed at..........

Special conditions ....

Name of examiner ....

TABLE L.

NUMBERS OF COMPOSITIONS SCORED BY SCHOOLS AND GRADES

School	4B	4A	5B	5A	6B	6A	7B	7A	8B	8A	Total
U	37										37
C		39			48			38		43	168
I			32			38	37		42		149
V				39							39
D	40				43			33		29	145
J		32		33						30	95
P			31								31
E	25										25
K		31			40						71
Q						23					23
W	30		34	39					30		133
L											—
R		31			33	27			31		122
X			40	23		38		27			128
Y	38		29				40				107
A		31		33							64
G			41		40					36	117
M	40			48		47	41	33	30		239
S		35			35			35		29	134
H			39			35	39		39		152
N	40			32							72
T		39									39
B			38		31			32		34	135
O	31	40		32		32	35		32		202
Totals	281	278	284	279	270	240	192	198	204	201	2427

Three persons, trained in the use of the scale, independently judged each composition on the Nassau County Supplement to the Hillegas Scale; and the median of the three judgments was the final value assigned each composition. Table LI shows the median values for each grade for the entire city, regardless of schools.

TABLE LI.

MEDIAN ACHIEVEMENT—PATERSON

Grade	4B	4A	5B	5A	6B	6A	7B	7A	8B	8A
Median Value	2.26	2.18	3.56	2.93	3.72	3.91	4.16	4.10	4.80	4.98

Table LI should be read as follows: The 4B grade attained a median value of 2.26; the 4A grade a median value of 2.18, etc. In three grades, i. e., fourth, fifth, and seventh, it is apparent that the difference in attainment between the A and B divisions is in favor of the B divisions.

By taking an average of the A and B divisions, the median attainment of each grade as a whole is found to be as follows:

Fourth Grade	Fifth Grade	Sixth Grade	Seventh Grade	Eighth Grade
2.22	3.29	3.86	4.13	4.89

The amount of improvement of each grade over the preceding grade is: fifth grade over the fourth, 1.07; sixth grade over the fifth, .57; seventh grade over the sixth, .27; eighth grade over the seventh, .76.

A comparison of the attainment of Paterson children in English composition with the children of other cities is made in Table LII.

Table LII shows very clearly that Paterson ranks below the average in achievement in English composition. The city occupies the tenth or eleventh place in a group of fourteen cities. Paterson's attainment is far below standard. This is again shown when the scores for Paterson are compared, as in Table LIII,

TABLE LII.

MEDIAN ACHIEVEMENTS IN ENGLISH COMPOSITION PATERSON COMPARED WITH THIRTEEN OTHER CITIES

	Median Scores Attained in Grades									
School System	IV	Rank	V	Rank	VI	Rank	VII	Rank	VIII	Rank
Lead, So. Dak.	3.57	3	4.11	2	4.64	4	5.01	4	5.57	6
Newark, N. J. (1 School)	2.39	9	2.51	14	3.56	12	4.33	8	5.27	8
Ethical Culture School, N. Y. C.			4.01	3	4.72	3	5.39	1	5.74	3
Chatham, N. J.	2.95	7	2.85	11	4.10	8	4.02	13	5.29	7
Salt Lake City, Utah	3.58	2	3.84	6	4.16	5	5.16	3	6.37	1
Butte, Mont.	2.34	10	2.80	12	3.41	14	3.77	14	4.11	12
Joplin, Mo.	3.60	1	4.19	1	4.85	2	5.34	2	5.59	5
Nassau County, N. Y.	2.76	8	3.42	8	3.82	10	4.18	10	4.56	11
South River, N. J.	2.31	11	2.55	13	3.78	11	4.75	7	5.62	4
Mobile County, Ala.	3.20	5	3.91	4	4.34	7	4.22	9	n. d.	n. d.
Mobile, Ala.	3.31	4	3.85	5	4.60	6	4.95	6	n. d.	n. d.
St. Paul, Minn.	2.02	13	3.38	9	3.54	13	4.12	12	4.96	9
Cold Spring, N. Y.	2.96	6	3.69	7	4.89	1	4.96	5	5.96	2
PATERSON, N. J.	2.22	12	3.29	10	3.86	9	4.13	11	4.89	10

n. d.—no data.

TABLE LIII.

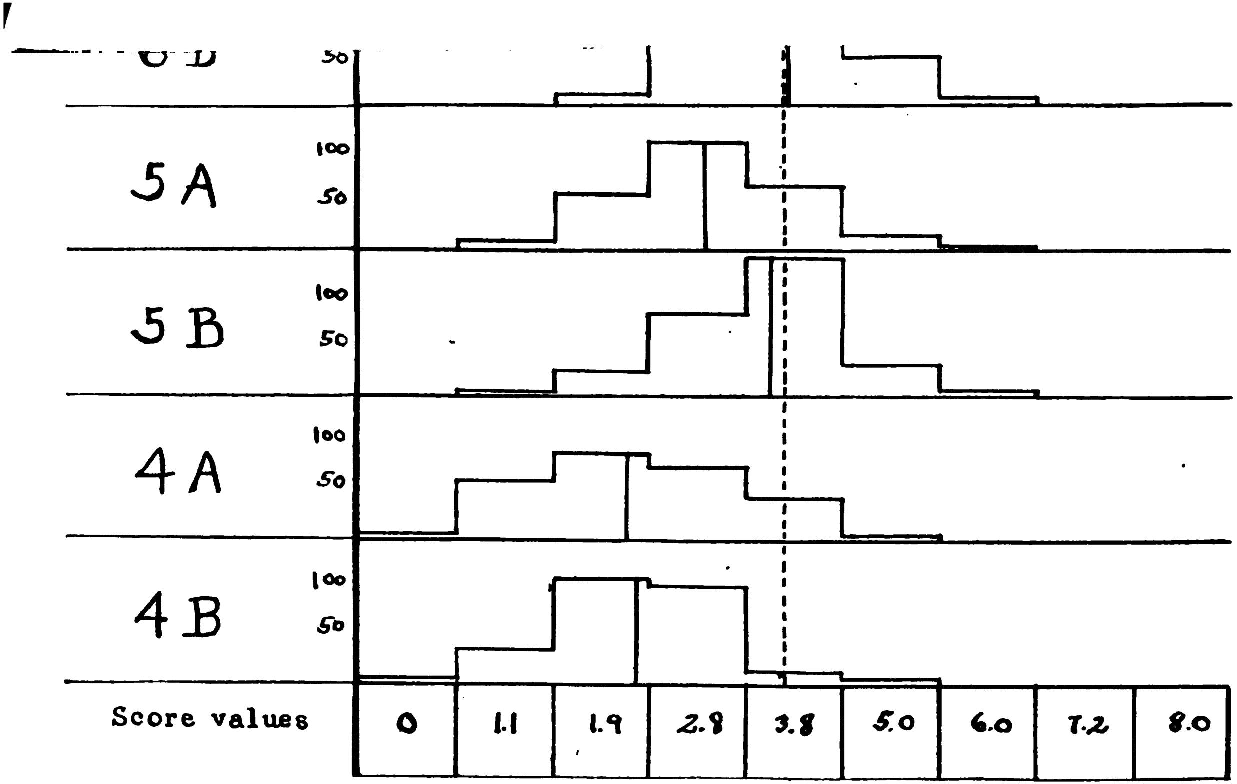
COMPARISON OF PATERSON SCORES WITH TRABUE STANDARDS.*

	IV	V	VI	VII	VIII
Trabue Standards	3.5	4.0	4.5	5.0	5.5
Paterson	2.22	3.29	3.86	4.13	4.89
Difference	1.28	.71	.64	.87	.61

*Teachers College Record, Jan. 1917.

with the tentative standard medians of achievement proposed by Trabue.

The fourth grade of Paterson is 1.28 units below the standard proposed by Trabue. It has also the lowest attainment of all the cities with which it is compared, except that of St. Paul (St. Paul 2.12). Grades five, six, seven, and eight are from six-tenths to nearly nine-tenths of a unit below the Trabue standards. They


50
5A
100
50
5B
100
50
4A
100
50
4B
100
50
Score values
0
1.1
1.9
2.8
3.8
5.0
6.0
7.2
8.0

are also far below the median attained in other cities. The attainment by schools and grade is shown in Tables LIV to LXIV, inclusive. A summary is given in Table LXV.

TABLE LXV

A SUMMARY OF THE DISTRIBUTION OF ENGLISH COMPOSITION SCORES BY GRADES

Score	4B	4A	5B	5A	6B	6A	7B	7A	8B	8A	Total
0	2	6						2			10
1.1	34	66	3	10							113
1.9	119	86	23	60	10	4					302
2.8	104	74	85	120	80	46	26	22	4	2	563
3.8	18	43	143	64	125	130	91	108	65	30	817
5.0	4	3	28	22	50	56	62	54	92	129	500
6.0			2	3	5	4	11	12	41	37	115
7.2							2		1	3	6
8.0									1		1
Total	281	278	284	279	270	240	192	198	204	201	2427
Median	2.26	2.18	3.56	2.93	3.72	3.91	4.16	4.10	4.80	4.98	3.61

TABLE LIV

DISTRIBUTION OF ENGLISH COMPOSITION SCORES BY GRADES AND SCHOOLS

4B GRADE

	SCHOOL								
Score	Y	M	N	O	U	D	E	W	Total
0					2				2
1.1	3	3	12	2	10	3		1	34
1.9	15	15	22	15	13	22	7	10	119
2.8	17	14	5	14	8	15	15	16	104
3.8	2	6	1		4		3	2	18
5.0	1	2						1	4
Total	38	40	40	31	37	40	25	30	281
Median	2.43	2.47	1.82	2.28	1.93	2.17	2.72	2.61	2.26

TABLE LV

DISTRIBUTION OF ENGLISH COMPOSITION SCORES BY GRADES AND SCHOOLS

4A GRADE

	SCHOOL								
Score	A	S	T	O	C	J	K	R	Total
0				1			4	1	6
1.1	4		22	11	9		15	5	66
1.9	4	3	15	19	19		9	17	86
2.8	16	13	2	8	7	20	2	6	74
3.8	7	16		1	4	12	1	2	43
5.0		3							3
Total	31	35	39	40	39	32	31	31	278
Median	2.82	3.43	1.39	1.87	1.98	3.14	1.28	1.99	2.18

TABLE LVI

DISTRIBUTION OF ENGLISH COMPOSITION SCORES BY GRADES AND SCHOOLS

5B GRADE

	SCHOOL								
Score	Y	G	H	B	I	P	W	X	Total
1.1	2					1			3
1.9	6	1			4	9	3		23
2.8	11	15	3	14	11	9	11	11	85
3.8	8	22	30	23	13	9	16	22	143
5.0	2	3	5	1	4	3	3	7	28
6.0			1				1		2
Total	29	41	39	38	32	31	34	40	284
Median	2.94	3.55	3.92	3.56	3.41	2.96	3.53	3.77	3.56

TABLE LVII

DISTRIBUTION OF ENGLISH COMPOSITION SCORES BY GRADES AND SCHOOLS

5A GRADE

	SCHOOL								
Score	A	M	N	O	V	J	W	X	Total
1.1		2	1	2		5			10
1.9	5	10	12	12	6	13	2		60
2.8	15	25	16	11	25	15	4	9	120
3.8	9	10	3	6	8		21	7	64
5.0	4	1		1			9	7	22
6.0							3		3
Total	33	48	32	32	39	33	39	23	279
Median	3.11	2.83	2.56	2.74	2.89	2.27	4.02	3.72	2.93

TABLE LVIII

DISTRIBUTION OF ENGLISH COMPOSITION SCORES BY GRADES AND SCHOOLS

6B GRADE

	SCHOOL								
Score	G	S	B	C	D	K	R		Total
1.1									
1.9	4		2		1		3		10
2.8	13	9	4	11	15	14	14		80
3.8	18	12	14	27	22	20	12		125
5.0	4	13	9	9	5	6	4		50
6.0	1	1	2	1					5
Total	40	35	31	48	43	40	33		270
Median	3.49	4.10	4.06	3.85	3.60	3.64	3.30		3.72

TABLE LIX

DISTRIBUTION OF ENGLISH COMPOSITION SCORES BY GRADES AND SCHOOLS

6A GRADE

	SCHOOL								
Score	M	H	O	I	Q	R	X		Total
1.9	1	1				2			4
2.8	12	10	2		9	4	9		46
3.8	26	18	17	24	12	14	19		130
5.0	8	5	12	14	2	6	9		56
6.0		1	1			1	1		4
Total	47	35	32	38	23	27	38		240
Median	3.77	3.72	4.22	4.19	3.56	3.91	3.90		3.91

TABLE LX

DISTRIBUTION OF ENGLISH COMPOSITION SCORES BY GRADES AND SCHOOLS

7B GRADE

Score	SCHOOL Y	M	H	O	I	Total
2.8	4	2	8	8	4	26
3.8	20	16	20	19	16	91
5.0	14	17	8	8	15	62
6.0	2	5	3		1	11
7.2		1			1	2
Total	40	41	39	35	37	192
Median	4.19	4.57	3.95	3.87	4.30	4.16

TABLE LXI

DISTRIBUTION OF ENGLISH COMPOSITION SCORES BY GRADES AND SCHOOLS

7A GRADE

Score	SCHOOL M	S	B	C	D	X	Total
0	2						2
2.8	8	2	2	3	5	2	22
3.8	15	17	16	28	21	11	108
5.0	8	11	12	6	7	10	54
6.0		5	2	1		4	12
Total	33	05	32	38	33	27	198
Median	3.80	4.31	4.28	3.95	3.92	4.46	410

TABLE LXII

DISTRIBUTION OF ENGLISH COMPOSITION SCORES BY GRADES AND SCHOOLS

8B GRADE

	SCHOOL						
Score	M	H	O	I	W	R	Total
2.8	2			2			4
3.8	19	6	15	13	4	8	65
5.0	7	24	15	14	16	16	92
6.0	2	8	2	12	10	7	41
7.2		1					1
8.0				1			1
Total	30	39	32	42	30	31	204
Median	4.07	5.02	4.48	4.87	5.15	4.92	4.80

TABLE LXIV

DISTRIBUTION OF ENGLISH COMPOSITION SCORES BY GRADES AND SCHOOLS

8A GRADE

	SCHOOL						
Score	G	S	B	C	D	J	Total
2.8			2				2
3.8	8	2	6	5	8	1	30
5.0	24	14	22	33	20	16	129
6.0	4	12	4	5	1	11	37
7.2		1				2	3
Total	36	29	34	43	29	30	201
Median	4.86	5.37	4.85	4.95	4.76	5.36	4.98

HANDWRITING

In securing specimens of handwriting to judge of the efficiency of the penmanship work done, two methods were followed. In the first case the quality of handwriting found in the fourth, fifth, sixth, seventh and eighth grade composition papers was rated. The compositions used for the purpose were selected by the process of random sampling. The pupils did not know when writing the compositions that they were to be rated for quality of penmanship. In the second case, a formal test in handwriting was given by members of the survey staff according to the following directions:

Provide each child with a sheet of the writing test paper, having the selection to be written printed at the top. See that other necessary materials are supplied; then give the following directions:

"We want to know how well you can write. When I tell you to begin, you are to copy the sentence 'I am buying War Savings Stamps in order to help win the the war' over and over again just as many times as you can before I tell you to stop. Remember, however, to write each time just as *well* as you can. Are there any questions?" As soon as all were ready the pupils were asked to dip their pens in ink and hold them suspended above the paper, ready to write. They were then started by the signal, "Begin writing." Exactly two minutes were allowed.

The quality of writing in the composition papers was measured to afford a comparison between the ordinary writing of pupils and their best writing.

The Thorndike scale for measuring the quality of handwriting was used in both cases in scoring the papers. The samples were each rated by three competent judges, each rating being made independently. The final rating given to any paper was the value agreed upon by two of the judges, or in cases of total disagreement of judges, the median judgment was taken. In the formal handwriting test both the rate and quality were measured.

The distributions show that no paper was rated lower than quality five and only one paper scored as high as quality seventeen on the Thorndike scale. The distribution shows also that there is only a difference of 2.7 units of quality between the typical third grade handwriting and the typical eighth grade handwriting. A unit of quality on the Thorndike scale represents a difference of quality that seventy five percent of a number of judges found it possible to detect. It is evident, then, that the amount of improvement from the third grade to the eighth grade represented by 2.7 units of 'perceptible difference' is wholly inadequate. There ought to be a difference of *at least* four units of quality between the typical third grade and the typical eighth grade handwriting.

The distributions also show that in the formal hand-

TABLE LXVI

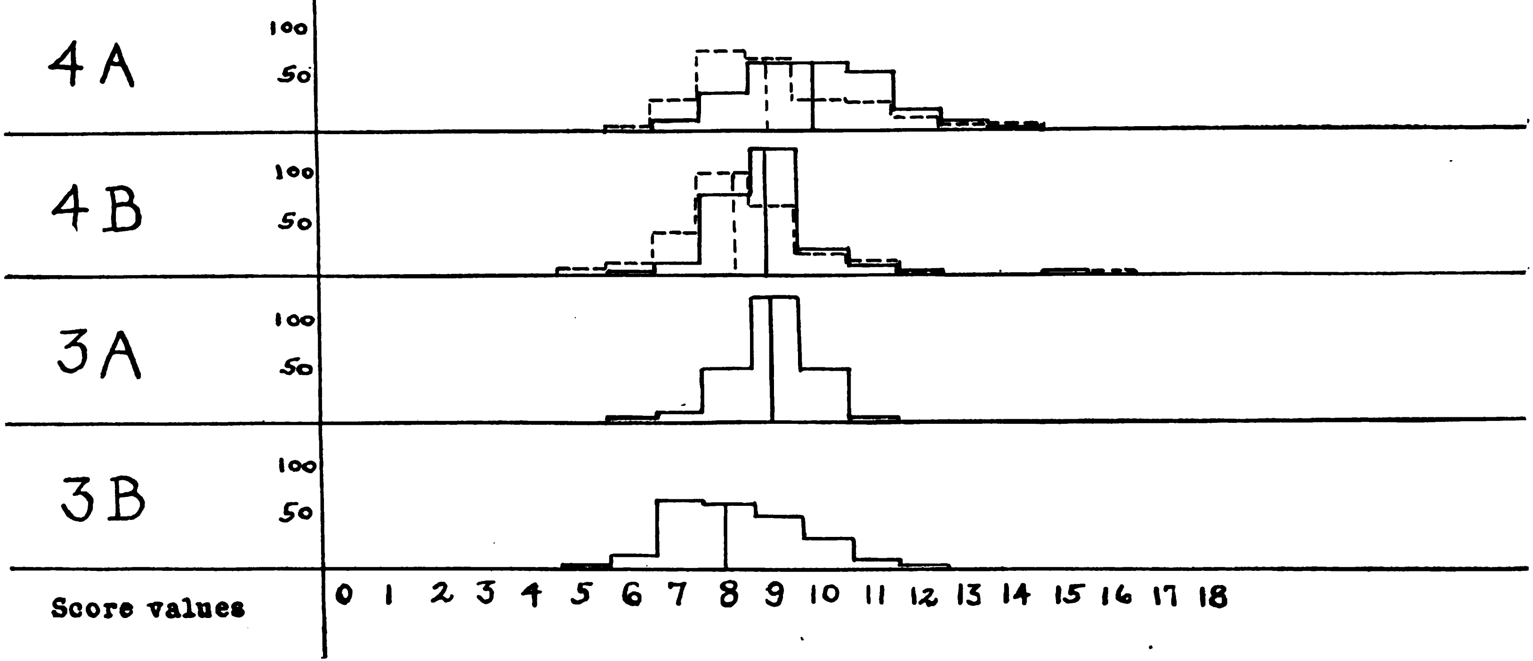
DISTRIBUTION OF FORMAL HANDWRITING SCORES.
QUALITY OF HANDWRITING.

GRADE	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Total	Median
3B						2	18	72	70	52	28	7	1							250	7.97
3A							2	11	54	130	54	4								255	8.96
4B							1	17	86	134	31	10	2			1				282	8.77
4A								8	39	70	70	59	22	6	1					275	9.79
5B								9	23	51	37	52	31	6	2	1				212	10.12
5A									2	23	47	50	58	29	15	4	3			231	11.37
6B									1	5	34	33	72	51	32	12	1	1		242	12.17
6A										19	39	71	45	4						178	10.94
7B								2	10	34	76	59	10	5	1					197	10.19
7A									2	33	69	69	29	7	2					211	10.52
8B									1	9	33	85	36	7						171	11.00
8A									4	39	51	58	33	7	1					193	10.54
Total						2	21	119	292	599	569	557	339	122	54	18	4	1		2697	10.05

TABLE LXVII

DISTRIBUTION OF HANDWRITING SCORES.
(ENGLISH COMPOSITIONS.)

GRADE	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Total Papers	Median Score
4B						2	8	49	109	71	28	12	1				1			281	8.2
4A							5	29	82	71	32	31	12	5	2					269	8.8
5B							13	31	66	75	32	24	8	2						251	8.7
5A								13	71	137	51	18	3	2						295	9.0
6B								2	43	94	52	50	8	2						251	9.4
6A								7	42	81	45	34	9							218	9.2
7B								4	26	55	60	41	21	5	1					213	9.8
7A									8	61	60	61	28	7						225	10.2
8B										9	12	25	28	47	32	7	2			162	12.7
8A										9	31	61	63	26	10		1			201	11.5
Total						2	26	135	447	663	403	357	181	96	45	7	4			2366	9.36


4A
4B
3A
3B
100
50
100
50
100
50
100
50
Score values
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

writing test no pupil above the 6B grade made a higher score than quality fourteen, although there are twenty-three higher scores.

The table showing the comparisons between the median quality of ordinary handwriting and the median quality of formal handwriting for each grade indicates that in the fifth and sixth grades there is entirely too much difference between the quality of formal handwriting and the quality of ordinary handwriting. It indicates that the speed of writing in the formal exercise is so much slower than that in ordinary writing that the skill acquired in the formal practice of writing in Paterson does not carry over to the ordinary written work. The fact that in Paterson the 6B work in formal handwriting is so much better than in any subsequent grade and also better than the median achievements in other cities shows that good work being done at that time in the course is allowed to deteriorate through lack of emphasis, inadequate instruction, or insufficient supervision.

The comparison of Paterson with other school systems with respect to the quality of handwriting shows Paterson to be below the standard achievements of the cities having comparable data in the fourth, fifth, and sixth grades, and considerably below the achievements in the seventh and eighth grades.

As to the objectives toward which to strive in the teaching of handwriting, those set up by Freeman are

LXVIII

MEDIAN QUALITIES OF ORDINARY HANDWRITING AND FORMAL HANDWRITING.

Grade	Ordinary Writing	Best Writing	Rate of Best Writing
3B		8.0	23
3A		9.0	26
4B	8.2	8.8	33
4A	8.8	9.8	31
5B	8.7	10.1	36
5A	9.0	11.4	41
6B	9.4	12.2	43
6A	9.2	10.9	46
7B	9.8	10.2	51
7A	10.2	10.5	53
8B	12.7	11.0	51
8A	11.5	10.5	54
All Grades	9.36	10.05	40

The rate of writing is expressed in the number of letters per minute.

TABLE LXIX.

QUALITY OF FORMAL HANDWRITING IN TEN SCHOOL SYSTEMS INCLUDING PATERSON.

	Median Qualities in Grades.				
	4	5	6	7	8
Paterson	9.12	10.7	11.1	10.4	10.9
Nassau Co., N. Y.	9.0	10.0	10.5	11.0	11.0
Chatham, N. J.	9.3	10.3	11.7	12.8	13.3
Salt Lake City, Utah	10.7	11.0	11.2	12.3	12.8
Lead, S. D.	9.8	11.0	11.1	12.2	13.4
Morris Township, N. J.	11.2	12.5	11.1	12.0	12.8
Butte, Montana	8.8	8.9	11.6	11.2	12.1
Newark, N. J.	9.9	11.5	11.9	12.2	13.2
Mobile, Alabama	10.5	11.7	12,0	12.5	
Connersville, Ind.	10.0	10.3	11.7	11.7	11.0
Paterson's Rank	8	6	9	10	9

the nearest approach to a definite statement of objectives for the several grades that has been made. They are as follows

Grade	2	3	4	5	6	7	8
Rate in letters per minute	36	48	56	65	72	80	90
Thorndike Scale	9.36	9.75	10.13	10.76	11.34	11.89	12.66
Ayres Scale	44	47	50	55	59	64	70
Freeman Scale	17.9	18.4	19.0	20.0	20.8	22.0	23.0

The principal avenues to improvement are (1) closer supervision to insure more uniform standards both within and between buildings, (2) closer analysis of handwriting difficulties in individual cases with special assistance, and (3) more emphasis on quality of handwriting in all written work.

SPELLING

The words used to test the spelling of the Paterson pupils were selected from the Ayres scale, which is made up of a thousand commonly used words divided into 26 groups, the words of one group being of approximately equal difficulty. The successive groups are supposed, also, to increase in difficulty by equal steps. The points on the scale are marked by the percentages of pupils in the different grades that should spell correctly the words of the several groups. These percentages were determined from the spellings of 70,000 children in systems all over the United States.

TABLE LXX.

Speed in Handwriting

Number of Letters per Minute.

Grade	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	76-80	81-85	86-90	91-95	96-100	101-105	106-110	111-115	116	Total	Median
3B	1	16	46	35	74	24	10	15	6	12			1												240	22.5
3A		6	21	19	92	27	15	21	13	28	6	1	2	1	3										255	25.5
4B		1	9	19	67	34	27	37	15	24	11	9	3	4	6	3	2	1	3	1	3	1	1	1	282	33.1
4A	3	2	15	16	66	36	26	31	25	26	7	9	3	5	3				1		1				275	31.0
5B		1	4	10	41	14	11	18	11	17	4	16	5	2	3		2	1	2						162	36.0
5A			2	8	25	24	22	35	24	43	18	15	2	5	7	1									231	40.9
6B				3	22	26	20	42	20	49	24	10	6	13	3		2		2						242	43.0
6A				2	16	13	12	24	19	34	11	17	10	11	1	2		3	1	1			1		178	46.4
7B					5	11	11	18	11	30	18	21	14	15	8	3	5	1	3						174	51.3
7A				1	3	6	10	22	15	38	31	25	16	11	16	7	2	1	7						211	52.7
8B	9				5	4	13	10	14	31	22	14	5	11	15		2	4	5	6					171	50.9
8A				3	2	11	12	12	11	28	28	35	14	14	17	4	2								193	54.1
	13	26	97	116	418	230	189	285	184	360	180	172	81	92	82	20	17	11	24	8	4	1	2	1	2614	39.8

The list of words used in testing the third, fourth, and fifth grades was made up by selecting one word from each of the sets, except the first on this scale. These twenty-five words varied in difficulty from one so easy, "go," that all the third grade should be expected to spell it, to one so hard, "recommend," that only one pupil per hundred of this grade could ordinarily be expected to spell it. To test the sixth, seventh, and eighth grades twenty words were selected from the upper ten sets of the scale, two words being taken from each set.

In giving the tests the procedure followed was to have the regular room teacher, in the presence of a survey examiner, pronounce each word, give a sentence containing it, and pronounce the word again.

The words of the two lists and the sentences containing the words are given here. The set from which they were taken is shown by the small letters b, c, d, etc.

LIST OF WORDS FOR THE THIRD, FOURTH, AND FIFTH GRADES

b. go	We *go* to school..
c. run	He can *run* swiftly.
d. top	The boy can spin a *top*.
e. little	The baby is very *little*.
f. today	We can go to school *today*.
g. mother	I love my *mother*.
h. much	The boy eats too *much*.

i. gave	I *gave* him an apple.
j. glad	The boy is *glad* that summer is coming.
k. becomes	Boys *become* men.
l. body	The elephant has a large *body*.
m. children	*Children* go to school.
n. evening	I shall go home this *evening*.
o. navy	The American *navy* contains many battleships.
p. beautiful	This is a *beautiful* rose.
q. newspaper	I read the *newspaper* every day.
r. forenoon	We came to school this *forenoon*.
s. marriage	The *marriage* ceremony was very impressive.
t. business	It is his *business* to sell groceries.
u. divide	*Divide* six by two.
v. secretary	His *secretary* wrote the letter.
w. separate	We *separate* the good apples from the bad.
x. receipt	He gave me a *receipt* for the money.
y. decision	The judge's *decision* favored the prisoner.
z. recommend	I *recommend* this boy for the position.

LIST OF WORDS FOR THE SIXTH, SEVENTH, AND EIGHTH GRADES

q. factory	We visited a munitions *factory*.
q. written	The word is *written* on the blackboard.
r. combination	The door has a *combination* lock.
r. neighbor	He is a good *neighbor*.
s. investigate	We shall *investigate* the matter

s. government	Our country has a democratic *government.*
t. business	He went into *business* with his father.
t. minute	There are sixty seconds in a *minute*
u. citizen	I am a *citizen* of the United States.
u. unfortunate	Some people are very *unfortunate.*
v. evidence	There was strong *evidence* against the prisoner.
v. arrangement	The *arrangement* of the rooms was convenient.
w. extreme	There was *extreme* danger in the experiment.
w. character	The girl has a strong *character.*
x. especially	This test is *especially* difficult.
x. convenience	The motor car is a great *convenience.*
y. decision	The judge's *decision* favored the prisoner.
v. principle	They fought for the *principle* of liberty.
z. judgment	One can depend on this man's *judgment.*
z. recommend	I *recommend* him for the position.

The selection of the classes to be scored for spelling was in accord with the general plan explained elsewhere. In scoring the tests only those spellings exactly like those in the lists were accepted as correct. All others were counted as misspellings.

Results of the Tests

The results of the tests in the classes scored are given in detail in Tables LXXI and LXXII. It appears from these results that there is steady progress in spelling throughout the school course. The increase from grade to grade is more pronounced in the higher grades.

The grade averages for the city show continuous improvements, but if those cases where a fair proportion of grades in any one school are represented as in School M are compared with the scores for the city, an indication of considerable irregularity in development is shown. Part of the grades will be decidedly below the city average, others just average, and some above the average. In a number of schools, also, one finds lower grades having better scores than the higher grades.

Another fact to be noted is that the differences in the achievements of the same grades of different schools are rather pronounced. For example: the seven 3B classes averaged 10.2 words spelled correctly, the lowest class averaged only 7.1 words, and the highest 14.1 words. The latter score was as high as that made by any 3A class, and almost as high as the average score of the 4B grades.

Among the individuals of any grade we find the widest variability. There were pupils in the 7B grade who spelled all the way from one to twenty words. Individual classes show almost as wide variability.

It is possible to compare the results for the third, fourth, and fifth grades with the scores of the thousands of pupils whose spellings were the basis of the Ayres scale and the scores made by the pupils of Nassau County, N. Y. These comparisons follow:

TABLE LXXI

COMPARISON OF THIRD, FOURTH AND FIFTH GRADE SCORES IN PATERSON WITH AYRES SCALE AND NASSAU COUNTY SCORES.

	Average Number of Words spelled Correctly in:								
	3B	3A	3B & 3A	4B	4A	4B & 4A	5B	5A	5B & 5A
Paterson	10.2	11.9	11.0	14.4	15.6	15.0	16.8	17.9	17.3
Ayres	12.8	14.3	13.5	16.2	16.9	16.4	17.9	18.7	18.3
Nassau Co.			12.0			15.4			18.0

The percentages given in the Ayres scale are for pupils who have completed half the work of a grade. The Ayres third grade, for example, means, in terms of Paterson, a grade which has just completed the 3B work and is ready to begin 3A work. As the above tests were given at about the middle of the term, it is necessary to calculate the proportion of correct spellings which the Ayres children would have made if they had been at the same place in their school course. To find this percentage for the 3B grade, for example, it is necessary to determine the point three-quarters of the way from 42 per cent, the average per cent of spellings that the 2B grade would be expected to make on these words, to 54 per cent, the expected 3B average. This will be about 51 per cent, assuming as was done in the construction of the scale, that spelling ability is normally distributed. These percentages were determined by reference to a table based upon percentage distributions as shown in a normal probability curve.

The test words used in Nassau County were not the same as those of the Paterson list, but they were selected in the same manner. The results from the two lists, therefore, should be comparable.

Comparison with the Ayres standard, after the above corrections have been made, and with the Nassau County results, shows Paterson scores to be the lowest of the three. Paterson results on the average are about 1.7 words, or seven per cent below the Ayres standard. They show, however, rather steady improvement from grade to grade.

The same comparison with the Ayres standard can be carried through the sixth, seventh, and eighth grades. When this is done, Paterson's showing is much better, her eighth grade record being markedly above the standard score.

TABLE LXXII

COMPARISON OF SIXTH, SEVENTH AND EIGHTH GRADE SCORES IN PATERSON WITH AYRES SCALE.

	Average Number of Words Spelled Correctly in:								
	6B	6A	6B & 6A	7B	7A	7B & 7A	8B	8A	8B & 8A
Paterson	9.3	9.7	9.5	12.8	14.1	13.4	15.5	17.5	16.6
Ayres	10.0	11.3	10.7	12.7	13.9	13.3	15.1	16.1	15.6

In Tables LXXIII and LXXIV the results of the tests in Paterson are presented in a different form. These tables show by grades the percentages of correct spellings of each word, and give for comparison the corresponding percentages on the Ayres scale. The percentages on the scale are extended below the 50% point under the assumption that spelling ability below that point is distributed in the same way that it is above it. The words are arranged in the order of difficulty assigned them by Ayres. The Paterson children do not find them difficult in the same order. Almost without exception the results for each of the words improve from grade to grade, but these results, except in the seventh and eighth grades, are quite regularly below the Ayres standards. Certain words, however, stand out rather sharply. Two of these are "divide" and "separate," the percentages of correct spellings for these words in the fourth and fifth grades being markedly above the standards. On the other hand, we find an unusually large proportion of eighth grade pupils misspelling "arrangement." In an examination of class scores we find, for example, about one-half of the 4B grade spelled "separate" correctly, and in one school 38 out of the 43 pupils in the class spelled it correctly, in another school 32 out of 36 pupils; but in two other schools we find that in one case only 3 out of 30 spelled it correctly, and in the other 5 out of 41. These facts tend to show that drill on particular words is the remedy for poor spelling.

Conclusions

The most pronounced thing pointed out by these tests is that Paterson children, if we accept the above lists of words as fair selections of words in common every-day use, do not have sufficient drill on this kind of words. Not enough attention is paid to the selection of words taught. This seems to be particularly true of the lower grades.

TABLE LXXIII.

PERCENTAGE OF PUPILS IN THIRD. FOURTH AND FIFTH GRADES IN PATERSON SPELLING VARIOUS WORDS CORRECTLY COMPARED WITH AYRES STANDARD FOR SAME WORDS

	Per cent. of Pupils Spelling Various Words Correctly.					
	3rd Grade		4th Grade		5th Grade	
Word	A	P	A	P	A	P
Go	100	93	100	97	100	98
Run	100	87	100	96	100	99
Top	99	83	100	94	100	98
Little	98	94	100	98	100	99
Today	96	91	100	97	100	99
Mother	94	94	99	96	100	99
Much	92	69	98	86	100	95
Gave	88	81	96	93	99	98
Glad	84	65	94	82	98	89
Become	79	72	92	90	96	96
Body	73	52	88	78	94	94
Children	66	75	84	89	92	96
Evening	58	41	79	67	88	74
Navy	50	32	73	70	84	94
Beautiful	42	9	66	32	79	56
Newspaper	34	27	58	60	73	84
Forenoon	27	8	50	27	66	87
Marriage	21	9	42	25	58	42
Business	16	2	34	6	50	46
Divide	12	12	27	61	42	68
Secretary	8	3	21	4	34	13
Separate	6	5	16	44	27	38
Receipt	4	0	12	8	21	4
Decision	2	0	8	8	16	4
Recommend	1	0	6	1	12	2
Average per cent.	54	44	66	60	73	69

A .... Ayres

P .... Paterson

Objections may be made that in the lower grades many of the words given in the tests are conceded to be upper grade words or, at least, are placed there by the Ayres scale. Reference to Table LXXIII shows, however, that on the admittedly third, fourth, and fifth grade words Paterson scores are uniformly below the standard.

Another outstanding feature of the spelling as revealed by these tests is the wide variability of the classes in the same grade throughout the city and of the individuals in the same classes. The former calls

TABLE LXXIV.

PERCENTAGE OF PUPILS IN SIXTH, SEVENTH, AND EIGHTH GRADES IN PATERSON SPELLING VARIOUS WORDS CORRECTLY COMPARED WITH AYRES' STANDARDS FOR SAME WORDS

	Per cent. of Pupils Spelling Various Words Correctly					
	6th Grade		7th Grade		8th Grade	
Word	A	P	A	P	A	P
Factory	84	94	92	95	96	99
Written	84	71	92	90	96	97
Combination	79	49	88	75	94	91
Neighbor	79	61	88	81	94	91
Investigate	73	54	84	91	92	92
Government	73	54	84	81	92	99
Business	66	77	79	61	88	78
Minute	66	77	79	85	88	89
Citizen	58	71	73	89	84	93
Unfortunate	58	45	73	67	84	81
Evidence	50	46	66	61	79	92
Arrangement	50	39	66	58	79	45
Extreme	42	50	58	89	73	96
Character	42	26	58	50	73	78
Especially	34	16	50	33	66	68
Convenience	34	10	50	41	66	76
Decision	27	20	42	38	58	73
Principle	27	16	42	28	58	65
Judgment	21	60	34	60	50	84
Recommend	21	13	34	52	50	72
Average per cent.	53	47	67	67	78	83

A .... Ayres

P .... Paterson

for more supervision, probably chiefly directed towards the more careful selection of the words to be taught. The latter undoubtedly calls for a re-distribution of class drill. The results tend to show that drill has been indiscriminate, the class receiving it as a whole. An attempt should be made to see that individual pupils receive drill on those words which particularly need it.

A study of the spelling ability of the children of Paterson, as shown in their composition, was made and the above conclusions were corroborated. The spelling of the "every-day" words was very deficient. The recommendation is earnestly made that individual teachers or else a committee of teachers should prepare a list of words frequently misspelled in the every-day work of the children. This list should not exceed 1000 words, and should then be drilled upon until a much higher degree of accuracy in ordinary written work is obtained. A very large percentage of the child's spelling difficulty would be included within this list.

TABLE LXXV.

DETAILED DISTRIBUTION OF SPELLING SCORES IN THIRD GRADES

Number of Pupils Spelling Correctly a Given Number of Words.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total	Median	Average
3B	Y							1	4	5	3	3	7	3	7	3	1	1	2	4		1						45	11.9	11.9
	M			2	6	4	2	10	4	1	1	3	2	3	1	1	1		1									42	6.7	7.1
	N						1		3	1	5	8	6	5	8	2		1										35	10.9	10.5
	T		1				2	1	3	2		4	3	5	4	4	1											30	11.7	10.3
	V						1	1	1			1	2	3	8	6	3	10	4	2	1							38	15.3	14.1
	P			1	1		4	2	7	6	1	3	2	1	1	2	2											33	8.3	8.4
	L		1		1	1	1	2	4	5	7	2		2	1													27	8.7	7.9
	Total		2	3	8	5	11	17	26	20	17	24	22	22	20	18	8	12	7	6	1	1						250	10.7	10.2
3A	A				1		2	2	3	2	2	2	5	3	2		1											25	10.3	9.3
	H					1			1	4	4	5	4	4	1	2	4	1	1	1	1							33	11.4	11.8
	B			1								1	2	3	6	8	4	5	2			1						33	14.2	18.8
	U		1		1	1		1	1	4	5	3	3	4	2	4	2	1		1								34	11.0	10.5
	I									2	3	2	4	6	6	3	5	4	3									38	13.3	12.9
	E					1		1	1	2	2	2	4	1	9	4		1	1		1							30	13.1	11.7
	W										2	2	3	3	2	3	5	1	6	1				1				29	14.7	14.1
	R					1	1	1	2	2	6	1	6	3	1	5		3			2							34	11.5	11.2
	Total		1	1	2	4	3	5	8	16	24	18	31	27	29	29	19	16	13	3	3	1		1				256	12.4	11.9
Total 3rd Grade			3	4	10	9	14	22	34	36	41	42	53	49	49	47	27	28	20	9	4	2		1				506	11.7	11.0

TABLE LXXVI

DETAILED DISTRIBUTION OF SPELLING SCORES IN FOURTH AND FIFTH GRADES

Number of Pupils Spelling Correctly a Given Number of Words.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	18	14	15	16	17	18	19	20	21	22	23	24	25	Total	Median	Average
4B	Y								2	1		1	2	1	2	5	3	3	4	3	1	1	1					30	15.3	14.6
	M					1						1	1		2	4	5	1	9	6	4	1			1			36	17.3	16.1
	T	1				1	1	1	2			1	1		3	3	4	5	5	5	5	3	2					43	16.7	12.9
	O									1	1	4	1	3	2	4	1	7	2	2	1	1						30	14.8	14.1
	C							1	2		1	4	3	6	3	5	2	4	5	4		1	1					42	14.2	13.5
	J									1		2	2	1	5	6	5	5	3	6	4	1						41	15.7	15.7
	K					2	1	1	2		3	4	6	1	2	4	3	6	2	2			2					41	13.3	12.5
	L							1		2		1	1		1		2	1	4	5	1	1						20	17.3	14.5
	Total	1				4	2	4	8	5	5	18	17	12	20	31	25	32	34	33	16	9	6		1			283	15.3	14.4
4A	G									1	2	1	2	6	8	2	3	6	3	3	1	2						40	14.0	14.2
	N								1		1	1	2	1	1	6	4	6	3	3	3			2				34	16.0	15.3
	B								1			1		1	1	3	5	2	2	2	3	3	3	1				28	17.0	16.5
	O										2		2	3	3	7	5	5	4	1	4	2	1					39	15.5	15.2
	I													2	2	2	6	7	7	4	3	3	1	1	1			39	17.1	16.8
	J												1		1	3	5	1	7	5	2	5	1					31	17.6	16.9
	Q								1	1	3	1	1	2	2	8	6	1	4	2	4	1	1					38	15.0	14.5
	X												1	2	3	4	4	5	1	6	2	5	1					34	16.6	16.3
	Total								3	2	8	4	9	17	21	35	38	33	31	26	22	21	8	4	1			283	16.2	15.6
Total 4th	Grade	1				4	2	4	11	7	13	22	26	29	41	66	63	65	65	59	38	30	14	4	2			566	15.9	15.0
5B	A										1				5	4	4	2		6	4	4		2				32	17.5	16.6
	M													1	2	4	7	4	5	7	7	3		1			1	42	17.6	17.0
	S																2	3	7	8	5	6	3	2				36	18.8	18.4
	O									1				2	7	3	8	6	2	5	2		1		1			38	15.8	15.4
	V														1	4	7	4	7	8	4	3						38	17.4	16.7
	L										1		1		1	3	2	6	2	3	2	4		1	1			27	16.9	16.7
	Total									1	2		1	3	16	18	30	25	23	37	24	20	4	6	2		1	213	17.5	16.8
5A	Y														1	1	2	2	1	1	8	5	5	2				28	19.8	18.8
	D			1					1					2	1	1	4	8	3	5	5	7	3		1			42	18.0	16.9
	P															1	2	2	9	7	2	9	4	3		1		40	18.9	18.6
	K												1	1	1	1	3	3	5	7	5	4	2	2				35	18.4	17.6
	Total			1					1				1	3	8	4	11	15	18	20	20	25	14	7	1	1		145	18.8	17.9
Total 5th	Grade			1					1	1	2		2	6	19	22	41	40	41	57	44	45	18	13	3	1	1	358	18.0	17.3

TABLE LXXVII

DETAILED DISTRIBUTION OF SPELLING SCORES IN SIXTH AND SEVENTH GRADES

		Number of Pupils Spelling Correctly a Given Number of Words.																							
Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	Median	Average
6B	M			4	1	4	3	4	3	4	2	4	3	2		1		1	1	1			38	8.0	7.9
	H				2	3	1	3		5	4	5		2	5	4	2	2	2	2			42	10.6	10.6
	B		1			1	1	4	3	3	3	3	4	2	2	2	2	2					33	10.5	9.8
	C				1	4	4	2	4	5	4	1	6		4	4	2	2	2		1		46	9.8	9.9
	Q			2	1	2	1	4	3	1	2	1	1	1	1				4	1			25	7.8	8.1
	R			2	3		4	2	4	4	3	2	3	1	3	1		2					34	8.5	8.3
	Total		1	8	8	14	14	19	17	22	18	16	17	8	15	12	26	19	9	4	1		218	9.3	9.3
6A	S				1	1	1	3	1	1	2	2	2	2	6	1	2		2	1			28	12.0	10.8
	O		1				1	2	3	3	2	3	4	3	4	3	2						31	11.1	10.2
	D				1	2	4	5	7	3	6	2	2	2	4	1	2	2	1				44	9.0	9.1
	W						1	2	6	3	4	7	4	4	3		1		2	2	1		40	10.6	10.6
	X	1	1	1	2	3	2	3	6	3	4	1	4	2	2	4	1	1	1				42	8.7	8.5
	Total	1	2	1	4	6	9	15	23	13	18	15	16	13	19	9	8	3	6	3	1		185	10.0	9.7
To'l 6th	Grade	1	3	9	12	20	23	34	40	35	36	31	33	21	34	21	14	12	15	7	2		403	9.7	9.5
7B	G			2				2	2	1	3	3	5	9	2	3	4		2	2			40	12.2	11.6
	S				1					1	1	1	4	2	5	4	3	5	4	2	3	2	38	14.5	14.3
	B									2	3		3	4	9	4	5	1	3	2	2		38	13.8	13.5
	O		1				2	2	1	2	1		3	3	6	4	3	4	2		2		36	13.5	12.2
	Q		1					1		1	3	3	1	2		1	3	2	3	1			22	12.5	12.1
	R					1		1	1		2	1	3	1	6		2	1		3	2		24	13.3	12.8
	Total		2	2	1	1	2	6	4	7	13	8	19	21	28	16	20	13	14	10	9	2	198	13.5	12.8
7A	M					1				1	2	1	2	1	3	6	3	3	2	6	3	1	35	15.2	14.5
	H											1	3	4	1	4	3	1	2	4	4		27	15.2	14.9
	B								1	1	2	2	2	3		9	3	2	1		2		28	14.3	13.2
	O					1		1	4	1	2	2	3	4	1	2	3	1	3		1		29	12.1	11.6
	C											1		2	3	5	8	4	2	6	4	3	38	15.5	15.9
	W									1	1	1		2		4	4	6	7	5	2		33	16.6	15.5
	X					2			1	2	3	2	3	3	1	2	1	4		2	1		27	12.2	11.9
	Total					4		1	6	6	10	10	13	19	9	32	25	21	17	23	17	4	217	15.0	14.1
T'tl 7th	Grade		2	2	1	5	2	7	10	13	23	18	32	40	37	48	45	34	31	33	26	6	415	14.3	13.4

TABLE LXXVIII

DETAILED DISTRIBUTION OF SPELLING SCORES IN THE EIGHTH GRADES

		Number of Pupils Spelling Correctly a Given Number of Words.																							
Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	Median	Average
8B	M							1		1	1	2	2		3	2	1	5	4	5	7	2	36	16.5	15.5
	B						1				1	1	3		3	8	6	3	4	4	2		36	15.5	14.6
	C									1		1		6	1	3	4	4	1	3	4	2	30	15.8	15.2
	D												2	3		2	3	6	5	12	6	1	40	17.8	16.6
	R						1						2		4	3	4	2	4	7	2		29	16.3	15.3
	Total						2	1		2	2	4	9	9	11	18	18	20	18	31	21	5	171	16.5	15.5
8A	M									1				1		3	3	3	4	4	7	5	31	18.1	17.0
	S															1		2	2	5	6	13	29	19.8	18.8
	B															1	1	2	7	11	10	3	35	18.6	17.9
	I							1					1	2	2	3	1	2	3	9	9	6	39	18.5	16.9
	W														2	1	1	7	4	12	6	6	39	18.4	17.6
	R													1	1	2	2	3	2	6	11	2	30	18.7	17.4
	Total							1		1			1	4	5	11	8	19	22	47	49	35	203	18.6	17.5
T'tl 8th Grade							2	2		3	2	4	10	13	16	29	26	+39	40	78	70	40	374	18.0	16.6

Arithmetic

In order to measure the results being achieved in arithmetic, three distinct types of arithmetic tests were used: the Woody test to measure the difficulty of the examples in each of the fundamental operations which the children can do; the Courtis test to measure the accuracy and speed of the pupils in solving examples in the four fundamentals; and the Stone test to measure the ability to reason.

1. *Woody Tests*

The Woody test begins with the simplest examples in each of the four fundamental operations and advances gradually in difficulty to problems that are so difficult that few of the eighth grade children are able to solve them. By this test one can measure just how difficult a problem in each of the four fundamental operations a child in any part of a class can do.

The Addition Test, which follows, will serve as a sample.

Series B

ADDITION SCALE

By Clifford Woody

Name ....

When is your next birthday? ....

How old will you be? ....

Are you a boy or girl? .... In what grade are you? ....

(1)	(2)	(3)	(5)	(7)	(10)
2	2	17	72	3 + 1 =	21
3	4	2	26		33
	3				35

(13)	(14)	(16)	(19)	(20)
23	25 + 42 =	9	$ .75	$12.50
25		24	1.25	16.75
16		12	.49	15.75
		15		
		19		

(21)	(22)	(23)	(24)	(30)
$8.00	547	1/3 + 1/3 =	4.0125	2½
5.75	197		1.5907	6⅜
2.33	685		4.10	3¾
4.16	678		8.673	
.94	456			
6.32	393			
	525			
	240			
	152			

(33)	(36)	(38)
.49	2 yr. 5 mo.	25.091 + 100.4 + 25 + 98.28 + 19.3614 =
.28	3 yr. 6 mo.	
.63	4 yr. 9 mo.	
.95	5 yr. 2 mo.	
1.69	6 yr. 7 mo.	
.22		
.33		
.36		
1.01		
.56		
.88		
.75		
.56		
1.10		
.18		
.56		

The tests were given to the following grades: Addition and Subtraction in the third and fifth grades and Multiplication and Division in the fourth and seventh grades.

The uniform directions for administering this test were as follows:

"The papers will be passed to you with the printed side downward. Please leave them so until I tell you to turn them over. Remember, do not move the papers or look at the printed side."

Pass the papers with the printed side down and the top end away from the pupil. Have the pupils record at the upper right-hand corner of the backs of the sheets their full names, ages at last birthday, grade, and school in the usual way. Show the card which lists the items for which you ask. When these facts have been recorded, make the statement which follows for the test to be given :

"Each problem on this sheet is a Subtraction problem (Multiplication problem, Addition problem, Division problem), a problem in which you take some number away from some other number (a 'times problem,' an 'and problem,' an 'into problem'). Remember, do not turn the paper until I give the signal. You are to work as many problems as you can and try to get them right. Do all your work on this sheet, and do not ask any questions. All stop when I give the signal. Do not fill in the headings on the printed side."

TABLE LXXIX

TABLE SHOWING DIFFICULTY OF PROBLEMS IN ADDITION (WOODY TEST) WHICH WERE SOLVED CORRECTLY BY 3A GRADE

Number of problems correctly solved.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	Number Pupils	Median
3A	H	1	0	0	0	0	0	0	1	0	0	1	2	1	3	3	1	3	3	3	4	5	3	1																	35	17.5
	R	1	0	1	0	0	0	0	0	0	0	1	1	0	0	4	4	1	2	8	6	0	2	2	0	1															34	18.3
	P	1	1	0	0	0	1	0	0	0	0	0	0	0	4	1	2	2	3	4	1	7	5	0	5	1															38	19.0
	L												1	0	1	1	3	0	2	8	4	2	2																		19	18.5
	K	2	2	1	0	1	2	0	0	0	1	0	0	3	0	4	1	4	3	3	5	8	2	1																	38	16.5
	A												2	1	0	2	1	1	3	2	0	2	2	3	1																20	18.0
	T	2	0	1	1	0	0	0	2	1	0	1	3	2	2	1	6	5	3	1	4	2	1	2																	40	15.7
	O	1	0	0	0	1	1	0	1	0	5	2	4	0	2	2	2	4	1	1	3	2	1																		33	13.8
	I	0	1	0	1	2	0	0	1	0	2	0	0	1	1	1	4	1	4	7	3	2	3	3																	37	17.8
	D							1	1	0	2	1	3	0	3	1	1	9	6	2	1	3	0	1	1																36	16.5
	Total	8	4	3	2	4	4	1	6	1	10	6	16	8	16	20	25	30	29	34	31	28	21	13	7	2															331	16

TABLE SHOWING DIFFICULTY OF PROBLEMS IN ADDITION (WOODY TEST) WHICH WERE SOLVED CORRECTLY BY 5A GRADE....

Number of problems correctly solved.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	Number Pupils	Median
5A	C															1	1	0	8	3	0	2	7	4	7	3	4	3	0	1	1	0	0	0	1						41	22.9
	E																			1	1	5	1	5	2	3	2	8	4	1	2	1	0	1							32	24.3
	B															1	0	1	0	0	1	4	6	4	3	5	8	1	2	1	1	2	0	1							36	23.3
	O																	1	2	3	1	2	5	7	4	3	1	1	0	1	0	1									32	22.3
	R													1	2	0	1	0	2	1	4	1	1	8	5	2	8	6	0	0	0	0	0	1							33	23.1
	M															1	2	0	0	2	2	6	7	7	7	5	3	1	0	1	1	1	0	1	1						48	22.6
	V																						2	2	2	4	2	2	5	5	7	4	2	0	1						38	28
	Q															1	0	1	1	1	4	3	8	0	1	4	1	0	2	1	0	1									34	22.8
	Y																			2	1	6	4	0	2	2	3	2	2	1	0	0	0	1	0	1					27	23.3
	N													1	2	0	0	0	1	1	2	3	3	4	3	3	2	0	2												27	22.
	Total													2	4	4	4	3	9	14	16	32	39	46	36	34	24	19	17	12	12	10	2	5	3	1					348	23

TABLE LXXX

TABLE SHOWING DIFFICULTY OF PROBLEMS IN SUBTRACTION (WOODY TEST) WHICH WERE SOLVED CORRECTLY BY 3A GRADE

Number of problems correctly solved.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	Number Pupils	Median
3A	T	2	0	1	0	0	0	0	1	2	4	4	2	1	2	2	0	3	3	7	3	1	2																		40	14.5
	R	1	1	1	2	0	0	0	0	2	3	2	5	2	0	4	3	2	1	11	1	1	1																		48	12.0
	K	4	10	1	0	0	0	1	0	1	0	1	2	0	2	2	4	2	4	3	1																				38	11.5
	H		1	1	0	0	0	1	0	1	1	2	4	4	3	2	4	2	1	2	3	0	2	0	1																35	13.8
	O		1	2	0	0	0	0	1	0	2	4	4	4	1	4	4	1	2	2	1																				38	12.6
	I		5	1	2	0	0	0	1	1	1	0	3	0	1	2	2	4	4	4	5	0	1																		37	15.8
	A			1	1	0	0	0	0	2	1	2	0	2	1	2	1	0	2	0	1	2	2																		20	14.0
	D		1	8	1	0	1	0	0	0	0	0	0	0	2	3	2	2	2	1	6	6																			35	15.8
	P		1	0	0	0	0	0	0	0	0	2	1	5	5	6	3	4	3	0	3	3	1	2																	39	14.9
	Total	7	20	16	6	0	1	2	3	9	12	17	21	18	17	27	23	20	22	30	24	13	9	2	1																320	13.9

TABLE SHOWING DIFFICULTY OF PROBLEMS IN SUBTRACTION (WOODY TEST) WHICH WERE SOLVED CORRECTLY BY 5A GRADE

Number of problems correctly solved.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	Number Pupils	Median
5A	B	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	8	5	3	5	3	3	2	1												36	21.8
	N						1	0	0	1	0	0	0	0	1	2	1	0	2	6	4	2	1	0	2	1	1	2													27	18.9
	Y																		1	2	3	6	3	4	2	0	2	4													27	21.5
	V																				1	1	5	2	7	4	10	7	1												38	24.8
	E														1	1	0	1	3	0	2	3	4	6	2	3	2	0	1	2											31	22.1
	L	2	0	0	1	0	0	1	0	0	0	1	0	0	1	0	0	3	1	4	2	6	2	3	2	2	0	1													32	20.0
	M						1	0	0	0	0	0	0	0		0	1	2	4	4	9	4	8	6	3	1	1	2	0	1											47	20.6
	C																	1	0	4	4	10	5	9	2	3	3														41	21.3
	O																		2	4	7	7	5	2	2	3															32	20.4
	Q																			2	7	8	5	5	2	3	2														34	21.0
	Total	3	0	1	1	0	2	1	0	1	0	1	0	0	3	3	2	7	18	26	48	55	43	40	29	23	24	18	3	3											345	21.3

TABLE LXXXI

TABLE SHOWING DIFFICULTY OF PROBLEMS IN MULTIPLICATION (WOODY TEST) WHICH WERE SOLVED CORRECTLY IN 4A GRADE

Number of Problems Solved Correctly.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	Number Pupils	Median
4A	R						2	0	1	0	1	0	1	0	4	2	2	4	5	3	2	3	0	1																	31	16.6
	J						1	3	0	0	1	1	0	3	4	5	2	3	5	3	1	2																			34	14.8
	P						6	2	0	2	0	1	0	2	1	2	6	4	3	6	3																				38	15.5
	W											1	1	1	1	1	8	4	9	5	5																				36	17.1
	A										1	1	1	4	1	3	5	4	3	0	1																				24	15.2
	G		1	0	0	1	3	1	1	1	0	0	3	2	1	0	5	8	3	5	2	1																			38	16.0
	M						1	0	0	0	1	1	1	1	0	1	7	8	2	2	3	3	0	1																	32	16.4
	H						1	0	0	0	1	0	0	3	1	6	4	9	5	4	4	1	0	1																	40	16.4
	B						2	0	0	2	0	0	0	1	3	3	7	2	3	7	1	2																			33	15.8
	O	1	0	0	0	2	14	3	0	0	2	1	3	0	1	2	2	2	1	1	3	1	1																		40	9.5
	C						9	0	0	0	0	0	3	2	0	4	2	5	3	2	2																				32	14.5
	Total	1	1	0	0	3	39	9	2	5	7	6	13	19	17	29	50	53	42	38	27	15	1	3																	378	15.2

TABLE SHOWING DIFFICULTY OF PROBLEMS SOLVED IN MULTIPLICATION (WOODY TEST) WHICH WERE SOLVED CORRECTLY IN 7 A GRADE

Number of Problems Solved Correctly.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	Number Pupils	Median
7A	S									1	1	0	1	0	1	0	0	0	0	0	0	0	1	1	2	1	2	4	2	2	3	1	5	2	1	1	2				34	28.0
	M																						1	0	1	2	2	1	3	4	2	5	5	3	2	2	0				33	30.1
	O								2	1	0	1	0	0	0	0	0	0	0	2	0	0	2	2	3	2	3	1	2	3	3										27	24.3
	B																1	0	0	1	0	0	0	0	0	0	2	2	1	3	4	3	2	4	4	1	1	1			30	30.3
	C																										1	1	1	0	3	4	5	4	4	7	3	1			34	32.5
	D															1	1	0	2	1	0	0	0	1	2	1	3	6	2	3	3	2	5	2	0	1					36	27.0
	W						1	1	0	0	0	0	0	0	0	1	0	2	0	1	0	0	0	0	2	3	2	5	0	2	3	5	0	3	2	1					34	26.8
	X																									1	1	2	4	4	4	3	2	0	3	1	2				27	30.3
	Total						1	1	2	2	1	1	1	0	1	2	2	2	2	5	0	0	4	4	10	10	16	22	15	21	25	23	24	18	16	14	8	2			255	29.1

TABLE LXXXII

TABLE SHOWING DIFFICULTY OF PROBLEMS IN DIVISION (WOODY TEST) WHICH WERE SOLVED CORRECTLY BY 4A GRADE

Number of Problems Solved Correctly.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	Number Pupils	Median
4A	A								1	0	2	3	4	4	2	2	3	1	1	0	1																				24	12.5
	G			2	0	1	1	2	4	5	5	3	4	5	2	2	0	1	0	0	1																				38	9.8
	M								2	0	1	0	1	1	2	4	6	1	3	2	2	1	1	1																	28	15.5
	H								1	3	0	2	3	6	3	2	6	5	5	3	0	0	1																		40	15.0
	B								1	0	0	2	1	2	2	6	3	5	2	2	2	1	3	0	1																33	15.8
	O		1	0	1	1	1	0	3	4	6	5	5	4	3	5	1	1	0	0	0	0	0	1																	42	10.8
	C									3	4	7	4	4	4	0	3	1	0	0	1	1																			32	11.5
	J						2	0	0	0	0	2	5	4	2	5	3	4	5	0	2																				34	14.4
	R						1	2	2	0	3	3	5	1	2	3	4	2	1	2																					31	11.9
	Total	0	1	2	1	2	5	4	14	15	21	27	32	31	22	29	29	21	17	9	9	3	5	2	1																302	13.1

TABLE SHOWING DIFFICULTY OF ROBLEMS IN DIVISION (WOODY TEST) WHICH WERE SOLVED CORRECTLY BY 7A GRADE

Number of Problems Solved Correctly.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	Number Pupils	Median
7A	M																				1		2	2	3	1	2	2	3	4	6	4	1	2							33	28.1
	B																					1	0	0	2	1	1	1	2	7	2	5	5	3	1						31	29.3
	X																								4	1	3	2	2	4	4	1	5	0	1						27	28.4
	D																			1	1	1	2	3	4	2	5	3	1	5	6	2									36	25.8
	N																				2	5	3	3	4	3	3	3	1	4	2	0	0	1							34	24.0
	C																									1	0	1	1	3	6	3	4	6	4	6					35	31.6
	O												1	0	0	0	0	0	2	1	4	2	1	5	2	3	5	0	0	1											27	22.7
	S																	1	0	0	0	2	1	4	5	2	6	3	7	2	0	0	0	2							35	25.4
	Total												1	0	0	0	0	1	2	2	8	11	9	17	24	14	25	15	17	30	26	15	15	14	6	6					258	26.9

TABLE LXXXIII

TABLE SHOWING DIFFICULTY OF PROBLEMS IN ADDITION (WOODY TEST) WHICH WERE SOLVED CORRECTLY BY 3B PUPILS

Number of Problems Solved Correctly. Number

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	Number Pupils	Median
3B	Y						1	0	0	0	0	0	1	4	2	3	4	4	4	6	5	4	2	2	1																48	17.63
	M	2	3	3	3	0	1	1	1	3	2	4	0	4	4	0	3	1	0	2	2																				39	10.13
	N	2	3	3	1	1	2	0	3	0	2	2	4	0	4	3	1	0	0	1	0	1																			33	9.75
	B	2	2	0	2	1	0	1	3	1	1	0	1	0	4	3	3	0	1	0	4	1	0	1																	31	13.38
	U						2	0	7	0	3	3	3	1	1	2	5	2	3	3	1	1																			37	12.50
	C	1	0	1	1	2	0	2	1	2	2	1	1	1	3	0	5	2	4	1	1	1	2	1																	35	13.83
	V	1	2	1	0	0	0	1	0	2	0	1	2	1	2	2	2	2	2	5	5	3	3	1																	38	17.00
	J			1	0	0	1	0	1	0	0	3	3	0	4	4	3	3	7	2	0	2	0	1																	35	15.17
	Q			1	0	1	0	0	3	1	0	2	2	4	1	4	2	1	3	2	2	1																			30	14.00
	W				1	0	0	1	0	0	1	0	0	1	3	0	4	3	3	4	3	0	2																		26	17.33
	X				1	1	0	1	0	0	0	0	1	5	1	1	0	1	1	3	2	1	1																		20	14.00
	Total	8	10	10	9	6	7	7	19	9	11	16	18	21	29	22	32	19	28	29	25	15	10	6	1																367	14.16

TABLE SHOWING DIFFICULTY OF PROBLEMS IN ADDITION (WOODY TEST) WHICH WERE SOLVED CORRECTLY BY 5B PUPILS

Number of Problems Solved Correctly.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	Number Pupils	Median
5B	I															1	0	3	0	2	0	5	6	5	3	3	4	2													34	22.00
	D											1	0	0	0	0	4	2	4	3	3	6	7	8	3	3	1	1	0	1											47	21.07
	P																	1	1	2	6	3	8	6	4	2															33	21.44
	K														1	0	1	0	4	3	6	5	9	7	4	1	1														42	21.11
	W														1	0	0	1	1	1	3	6	6	9	3	2	2														35	21.75
	A																1	2	1	2	8	10	6	2	5	1	2														35	20.85
	G														1	2	4	1	2	3	8	2	5	4	2	3	3	1	1												42	20.00
	H															1	2	3	1	4	3	2	4	5	5	3	3	1	0	1											38	21.25
	B															1	0	0	1	1	3	9	4	4	1	2	4	1	1	0	1										35	21.18
	O	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	2	5	8	5	9	7	3	1															39	21.06
	Total	1	0	0	0	0	0	0	0	0	0	1	0	1	3	5	13	14	17	26	40	53	64	57	33	21	20	6	2	2	1										380	21.25

TABLE LXXXIV

TABLE SHOWING DIFFICULTY OF PROBLEMS IN SUBTRACTION (WOODY TEST) WHICH WERE SOLVED CORRECTLY BY 3B PUPILS

Number of Problems Solved Correctly.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	Number Pupils	Median
3B	Y		1	4	0	1	0	0	1	0	1	2	3	1	7	2	6	5	2	3	1	2																			44	14.50
	M	6	3	2	1	2	1	1	0	3	1	2	7	1	2	1	3	1	2	1																					40	10.00
	N	2	2	2	5	0	1	1	0	0	4	3	3	1	0	1	2	1	1	2	1																				33	9.88
	B	2	2	4	1	1	1	1	1	3	0	4	2	2	0	0	2	1	2	0	2																				31	8.83
	U	1	1	2	2	0	1	0	1	1	3	3	0	9	2	6	1	2	0	2																					37	12.39
	C	3	7	7	2	0	0	1	0	2	1	1	2	3	2	2	1	1																							35	3.25
	N						1	0	0	0	1	1	1	5	5	3	4	1	5	5	1	1	2																		38	15.50
	J			1	0	0	1	1	0	0	1	0	2	1	3	3	2	0	3	3	4	4	2																		35	17.83
	Q	1	0	1	2	0	1	1	0	0	1	2	1	4	3	1	2	1	4	3	1																				30	18.33
	W										1	2	2	4	4	3	2	3	1	1	1	1																			26	14.00
	X		4	7	0	0	0	0	1	1	0	1	1	1	0	2	0	1	1	0	1																				21	2.93
	Total	15	20	30	13	4	7	6	4	10	14	21	24	32	28	24	25	17	21	20	12	8	4																		370	12.53

TABLE SHOWING DIFFICULTY OF PROBLEMS IN SUBTRACTION (WOODY TEST) WHICH WERE SOLVED CORRECTLY BY 5B PUPILS

Number of Problems Solved Correctly.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	Number Pupils	Median
5B	D								1	0	1	0	0	0	0	1	3	5	8	4	2	8	5	5	2	2															47	19.25
	G	1	1	0	0	0	0	0	0	0	0	2	2	1	1	1	2	0	0	4	5	12	6	4	1																43	20.13
	I															2	0	1	2	5	5	10	2	7																	34	20.20
	W																2	3	4	4	5	4	7	4	2																35	19.90
	P																1	0	2	5	12	4	5	2	0	1															32	19.67
	K	2	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	3	4	3	6	3	8	5	1																41	19.42
	B									1	0	1	0	0	0	0	0	3	5	7	6	3	4	3	2																35	19.08
	H					1	1	0	0	0	0	0	0	2	0	1	1	7	2	4	4	6	2	5	0	2															38	19.00
	A													3	4	0	2	3	4	7	4	4	2	2																	35	18.22
	O		1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	5	8	4	5	5	8																	39	19.63
	Total	3	2	0	0	1	1	0	1	1	1	3	2	6	7	7	16	25	36	51	53	59	46	45	8	5															379	19.50

TABLE LXXXV

TABLE SHOWING DIFFICULTY OF PROBLEMS IN MULTIPLICATION (WOODY TEST) WHICH WERE SOLVED CORRECTLY BY 4B GRADE

Number of Problems Solved Correctly.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	Number Pupils	Median
4B	Y					3	5	3	2	3	0	2	2	3	4	1	2	1	2	2																						35	10.8
	N				1	1	6	2	3	5	5	4	0	1	1	3	0	1																								33	8.7
	X				2	0	3	1	3	8	6	3	4	2	2																											34	9.0
	T					1	1	0	3	1	0	7	5	3	7	7	3	1	1																							40	12.7
	U		1	0	0	2	1	3	1	1	3	1	5	3	3	3	4	1	2																							34	11.8
	V					2	3	0	0	1	4	1	3	1	10	4	4	3	1																							37	12.4
	E						2	0	0	0	1	1	2	2	2	4	3	2	3	0	0	1																				23	14.4
	K		1	0	0	1	10	1	7	1	2	2	5	2	4	2	1																									39	7.9
	L	1	0	0	1	1	3	1	0	2	1	2	3	2	3	1	0	1																								22	10.5
	Total	1	2	0	4	11	34	11	19	22	22	23	29	19	36	25	17	10	9	2	0	1																				297	11.0

TABLE SHOWING DIFFICULTY OF PROBLEMS IN MULTIPLICATION (WOODY TEST) WHICH WERE SOLVED CORRECTLY BY 7B GRADE

Number of Problems Solved Correctly.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	Number Pupils	Median
7B	O															1	0	0	0	2	2	2	0	2	5	6	3	6	1	3	0	1	1	1								36	24.7
	G									1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	5	4	2	5	2	2	3	6	3	3	0	1						39	27.3
	X																					1	0	0	0	1	1	0	2	4	2	2	1	2	3	1	2	0	0	0	1	23	30.8
	R											1	0	0	0	1	0	1	2	1	0	2	2	1	2	5	1	4	1	1	2	2	2	6	1	0	2					40	26.3
	I																1	0	1	0	0	0	0	3	3	5	5	4	2	4	6	4	2	1								41	26.6
	H																				2	0	0	1	3	1	2	3	5	7	3	2	1	5	0	1						36	28.2
										1	0	1	0	0	0	2	1	1	3	3	4	6	2	8	18	22	14	22	13	21	16	17	10	18	4	3	4	0	0	0	1	215	27.0

TABLE LXXXVI

TABLE SHOWING DIFFICULTY OF PROBLEMS IN DIVISION (WOODY TEST) WHICH WERE SOLVED CORRECTLY BY 4B GRADE

Number of Problems Solved Correctly.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	Number Pupils	Median
4B	E									2	2	1	2	4	4	2	2	1	1	0	1	0	1																		23	13.1
	Y					1	0	0	1	3	4	4	7	3	3	3	5	1																							35	11.6
	N	2	0	1	2	3	1	3	8	7	1	4	0	1																											33	7.6
	X			2	2	2	5	2	1	2	5	2	8	1	1	1																									34	9.2
	T						1	1	2	7	7	10	3	2	6	0	0	0	0	1																					40	10.2
	U			2	0	0	1	0	3	5	2	3	2	5	2	4	1	2	0	1	1																				34	11.5
	V							3	1	2	0	5	7	5	4	2	3	1	4																						37	12.1
	L						2	2	1	0	2	1	2	2	5	2	3																								22	12.5
	S					1	0	1	4	2	8	5	3	2	1	1																									28	9.8
	K		1	0	1	1	2	7	5	5	7	2	5	2	0	1																									39	8.5
	Total	2	1	5	5	8	12	19	26	35	38	37	39	27	26	16	14	5	5	2	2	0	1																		325	10.3

TABLE SHOWING DIFFICULTY OF PROBLEMS IN DIVISION (WOODY TEST) WHICH WERE SOLVED CORRECTLY BY 7B GRADE

Number of Problems Solved Correctly.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	Number Pupils	Median
7B	G				1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	3	3	4	1	1	2	7	3	2	2	3	2	1								39	25.1
	H																					5	1	3	2	3	5	3	5	2	3	0	4	1							37	25.9
	O														1	1	0	1	0	3	2	4	4	7	3	1	2	0	5	1	1										36	22.3
	I																1	0	2	1	3	0	1	5	6	5	6	2	4	1	0	2	1	1							41	24.3
	Q																					1		1	0	0	1	3	1	4	0	5	2	2	2	1					23	30.1
	R													1	0	1	1	1	0	1	1	1	2	3	5	2	4	2	1	0	3	3	2	3	0	1	1				39	25.1
	Total				1	0	0	0	0	0	0	0	0	1	1	2	3	2	3	7	9	14	12	20	17	13	25	13	18	10	10	12	10	7	2	2	1				215	25.1

Twenty minutes were allowed for the solution of the examples in each operation. The score achieved by each pupil is the number of problems he had been able to solve correctly in the twenty minutes. Since the examples are arranged in the order of difficulty from easy to hard, it may be assumed that a child solved the easier problems first, and that the score shows how difficult an example any child can solve.

Table LXXIX gives the distribution showing the difficulty of problems in addition which the children of the third and fifth grades tested were able to solve. In other words one child in the 3A grade in School P was not able to solve a single problem, while another child in the same class was able to solve twenty-four problems. It must be evident, if the instruction is suited to the advanced pupils of the grade, that there are many who fail to profit from it. If the instruction is suited to the less advanced pupils, the advanced pupils waste much time and develop the habit of mental loafing. The problem to be settled is, can the instruction be planned so that the needs of the individuals in the class, as it is graded at present, can be met? Or must the classes be regraded to have children who are more nearly alike in ability so that instruction will more nearly meet the needs of the class?

Compare the results in addition of the 3A and 5A grades two years apart. Are there not many in the third grade who have as great ability to solve problems of the same degree of difficulty as half of the pupils in the fifth grade? Note the upper half of the third grade and where these children are located on the scale in reference to the fifth grade.

This may be noted in subtraction (Table LXXX). In multiplication and division (Tables LXXXI and LXXXII), there is overlapping even though the two grades fourth and seventh are three years apart. In 7A division the difference between schools C and O is very marked. School O with the smallest number of pupils has the lowest median for the group (22.7), while school C with one of the largest classes has the highest median achievement (31.6). This discrepancy is typical of the many problems for supervisors to solve which arise from a study of these distributions of ability.

It is interesting to note whether this overlapping is true in the accuracy and speed with which the eighth grades solve the problems in addition, subtraction, multiplication, and division (Courtis tests).

Table LXXXVII shows the median results obtained in Paterson compared directly with the combined results obtained by Dr. Woody from several hundreds of children in these grades of more than half a dozen widely separated school systems, also with the results obtained in Nassau County, N. Y.

TABLE LXXXVII

ADDITION SCORES

	Grade		Grade		Grade		Grade	
	3B	3A	4B	4A	5B	5A	7B	7A
Paterson	14.16	16.0			21.25	23.0		
Nassau County		16.2				24.3		
Other Scores		14.5				23.0		

SUBTRACTION SCORES

	Grade		Grade		Grade		Grade	
	3B	3A	4B	4A	5B	5A	7B	7A
Paterson	12.53	13.9			19.5	21.3		
Nassau County		16.9				23.1		
Other Scores		11.2				20.4		

MULTIPLICATION SCORES

	Grade		Grade		Grade		Grade	
	3B	3A	4B	4A	5B	5A	7B	7A
Paterson			11.0	15.2			27.0	29.1
Nassau County	21.1				25.7			31.4
Other Scores	4.7				18.3			30.6

DIVISION SCORES

	Grade		Grade		Grade		Grade	
	3B	3A	4B	4A	5B	5A	7B	7A
Paterson			10.3	13.1			25.1	26.9
Nassau County	9.4					20.9		28.9
Other Scores	5.8					16.5		27.4

It will be noted from the above table that in addition the children of the third grade in Paterson equal the children of Nassau County, and in subtraction are lower, although they do not fall as low as the score of the third grades tested by Dr. Woody. The children of the fifth grades in Paterson in addition fall below the children of the fifth grade in Nassau County, and are equal to the fifth grades tested by Dr. Woody, while in subtraction they are much below Nassau County but superior to those tested by Dr. Woody. In the work in multiplication and division, the report is not so favorable—the seventh grade in Paterson is poorer in both multiplication and division than the Nassau County group and the other groups tested by Dr. Woody.

2.*Courtis Tests.*

For the purpose of measuring the speed and accuracy with which children can solve problems, the eighth grade pupils were tested with the Courtis tests, Series B. Twenty-five problems of approximately the same difficulty in each of the four fundamental operations were used. The types of problems used are indicated by the following problems in addition, subtraction, multiplication, and division.

SAMPLES FROM COURTIS STANDARD RESEARCH TESTS

Test No. 1.

ARITHMETIC **ADDITION**

927	297	136	486	384	176	277	837
379	925	340	765	477	783	445	882
756	473	988	524	881	697	682	959
837	983	386	140	266	200	594	603
924	315	353	812	679	366	481	118
110	661	904	466	241	851	778	781
854	794	547	355	796	535	849	756
965	177	192	834	850	323	157	222
344	124	439	567	733	229	953	525

Test No. 2.

SUBTRACTION

107795491	75088824	91500053	87939983
77197029	57406394	19901536	72207316

Test No. 3.

MULTIPLICATION

8246	3597	5739	2648	9537
29	73	85	46	92

Test No. 4.

DIVISION

25)6775	94)85352	37)9990	86)80066

The Courtis tests for accuracy and speed in the fundamentals were given in the eighth grade classes in which the Stone tests for reasoning were given. The tests were given according to the printed directions which appear on each book of test sheets. The introductory directions were as follows:

Pass papers with 'addition side' down. Then have all papers turned at the same time. The examiner should then read directions at top of page to the class. (Blanks for name, age, etc., are not to be filled until after the close of the Addition test). Be careful in all tests to have all pupils start and stop at exactly the same time. Direct pupils to turn one page to Test No. 2, Subtraction. Examiner read direction at top and proceed as for Test 1. Similarly for Tests 3 and 4.

Each test contains enough problems so that few, if any, pupils can be expected to solve all the problems in the list. The speed of each pupil is fairly sure to be measured by the test. The number of problems solved correctly by a child is counted as his score.

Table LXXXVIII shows the median score of the eighth grade in Paterson in addition, subtraction, multiplication, and division as compared with the median scores of the eighth grades of several other school systems throughout the country.

TABLE LXXXVIII

COMPARISON OF THE MEDIAN SCORES MADE BY CHILDREN IN THE EIGHTH GRADE IN PATERSON WITH THE MEDIAN SCORES OF EIGHTH GRADES ELSEWHERE IN COURTIS SPEED TESTS IN ARITHMETIC (SERIES B)

Eighth grade median scores in	Add.	Subt.	Mult.	Div.
Paterson	6.4	8.4	8.1	7.5
Nassau County	6.0	8.9	6.8	8.0
Twenty Indiana Cities	5.8	8.9	7.3	9.0
Fifty-two Iowa Cities and Towns	7.2	10.6	9.3	9.8
Butte, Montana	5.8	10.3	8.6	10.7
Detroit, Michigan	6.7	9.5	7.5	8.8
Boston, Mass.	7.8	8.6	6.5	6.9
Salt Lake City, Utah	7.6	10.3	8.8	9.9
Courtis	8.0	10.0	8.0	9.0

In this table it will be noted that the eighth grade in Paterson ranks sixth from the highest in a series of nine in addition; it ranks lowest of the nine in subtraction; it ranks fourth from the highest of the nine in multiplication; and eighth from the highest in division. In other words, Paterson is poorer in accuracy and speed in subtraction and division than it is in addition and multiplication, and it is below the standard in accuracy and speed in all the processes except multiplication when compared with Mr. Courtis' own standard.

In Tables LXXXIX, LXXXX, and LXXXXI, the results of the eighteen eighth grades tested in addition, subtraction, multiplication and division are given.

TABLE LXXXIX

DISTRIBUTION OF 8TH GRADE PUPILS ACCORDING TO THE NUMBER OF PROBLEMS IN ADDITION SOLVED CORRECTLY—COURTIS TESTS

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Number Pupils	Median
8A	B		1	0	3	3	2	7	2	5	1	3	0	3	0	1	0	1										32	7
	H					2	0	1	3	9	3	4	1	3	4	1	0	0	0	1	0	1						33	9.5
	O			1	1	3	3	4	6	1	4	5	2	1	2	0	0	1										34	7.8
	M		2	2	3	3	6	6	3	1	3	1	1	3														34	6.1
	S		2	2	0	4	6	1	5	2	2	1	2															27	5.9
	G	1	0	0	1	3	3	6	5	1	5	3	2	1	0	2	1	0	0	0	1							35	7.9
	W		1	0	1	4	1	4	10	4	5	3	2	3	1	0	1											40	7.9
	I		1	2	2	4	5	4	8	4	2	2	0	1														35	6.9
	D		1	0	2	8	8	6	4	2	2																	35	5.8
	Total	1	8	7	13	34	34	39	46	29	27	22	10	15	8	4	3	2	0	1	1	1						305	6.36

ADDITION COURTIS TESTS

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Number Pupils	Median
8B	O	1	0	1	1	2	2	3	5	5	1	1	2	1	1	1												27	7.7
	W			2	1	7	3	6	5	2	1	0	0	1														28	6.2
	S			3	3	4	4	4	7	1	0	1	1	1														29	6.1
	H				2	1	1	5	5	4	4	6	3	2	0	2	1	0	2	0	0	0	0	0	1			39	9.4
	M		1	0	4	6	5	5	1	5	1	0	2	2	1													33	6.1
	C		2	1	4	3	4	6	4	1	0	1	2	0	1													29	6.1
	R			7	1	3	4	4	1	4	2	0	0	0	0	0	0	0	0	0	0	1						27	5.6
	B			3	7	3	6	3	9	1	0	1	1	1	0	1												36	5.8
	I			2	9	1	7	6	7	4	2																	38	6.0
	Total	1	3	19	32	30	36	42	44	27	11	10	11	8	3	4	1	0	2	0	0	1	0	0	1			286	6.5

TABLE LXXXX

DISTRIBUTION OF 8TH GRADE PUPILS ACCORDING TO THE NUMBER OF SUBTRACTION PROBLEMS SOLVED CORRECTLY—COURTIS TESTS.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Number Pupils	Median
8A	B	2	1	0	0	1	3	4	3	4	5	2	2	2	2	0	1											32	9.2
	H						3	0	2	5	5	7	1	2	2	2	1	1	1	1								33	10.2
	Q	1	0	1	0	2	3	4	7	5	4	3	1	1	2													34	8
	M					2	1	3	1	3	6	3	3	7	0	1	1	1	0	0	1	0	0	1				34	10.1
	S						2	4	3	4	5	4	0	2	1	0	1	0	0	0	0	0	1					27	9.1
	G				2	0	1	3	1	6	3	3	2	2	3	4	2	1	1	1								35	10.5
	W		1	0	2	3	2	1	3	8	10	3	3	3	0	1												40	9
	I								6	3	8	5	4	3	2	2	1	1										35	10.1
	D						2	3	4	6	4	6	2	2	1	0	0	3	0	1								35	8.6
	Total	3	3	1	4	8	17	22	30	44	50	36	18	24	13	10	7	7	2	3	1	0	1	1				305	8.41

SUBTRACTION COURTIS TESTS

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Number Pupils	Median
8B	O				1	2	3	5	5	4	1	2	2	3	0	1												29	7.7
	W	1	0	1	2	8	4	2	5	3	0	0	2															28	5.5
	S	1	0	1	1	3	4	6	6	3	2	0	0	0	0	0	2											29	6.8
	H						2	5	1	4	2	5	1	1	6	2	1	4	3	0	1	0	1					39	11.3
	M					1	0	3	6	4	5	4	2	4	3	1												33	9.5
	C				1	1	0	7	2	7	2	4	2	0	2	0	1											29	8.5
	R		3	0	4	3	0	3	1	3	2	6	1	0	0	0	1											27	7.3
	B			4	2	1	4	6	4	5	3	3	2	1														35	7.1
	I	1	0	0	1	2	2	3	5	9	2	7	2	2	1	1												38	8.6
	Total	3	3	6	12	21	19	40	35	42	19	31	14	11	12	5	5	4	3	0	1	0	1					287	8.0

TABLE LXXXXI

DISTRIBUTION OF 8TH GRADE PUPILS ACCORDING TO THE NUMBER OF MULTIPLICATION PROBLEMS SOLVED CORRECTLY—COURTIS TESTS.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Number Pupils	Median
8A	B					1	1	1	3	5	3	4	6	4	2	0	2											32	10.5
	H						4	3	1	7	4	5	6	2	0	0	1											33	9.4
	O				2	8	1	3	5	5	0	8	5	1	0	1												34	8.6
	M				1	3	1	2	4	5	3	3	3	6	1	1	1											34	9.1
	S	2	0	0	1	2	3	7	2	4	4	0	2															27	6.8
	G				1	1	1	2	5	6	3	5	1	5	8	2												35	9.5
	W			1	0	3	2	3	11	1	5	5	6	1	1	1												40	8
	I			1	0	0	1	3	3	6	5	7	3	3	0	2	0	0	0	0	0	1						35	9.7
	D						1	2	9	4	3	10	5	0	0	1												35	9.5
	Total	2	0	2	5	13	15	26	43	43	30	47	37	22	7	8	4	0	0	0	0	1						305	8.1

MULTIPLICATION COURTIS TEST

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Number Pupils	Median
8B	O			1	2	0	2	5	7	4	2	2	2	1	0	1												29	7.6
	W		2	1	2	1	3	6	1	7	3	1	0	0	1													28	6.8
	S	1	0	2	0	2	6	6	3	5	2	0	0	0	1	0	1											29	6.6
	H			2	3	1	2	2	6	2	6	2	4	4	3	0	0	2										39	9.3
	M			1	2	2	7	2	4	6	2	2	3	2														33	7.6
	C					3	4	8	3	4	2	1	1	1	2													29	6.9
	R			2	3	5	2	3	5	2	2	2	0	1														27	6.5
	B	1	0	1	1	3	6	5	3	8	4	1	1	1														35	7.2
	I						1	5	7	3	4	4	4	5	2	1	1	1										38	9.8
	Total	2	2	10	13	17	33	42	39	41	27	15	15	15	9	2	2	3										287	7.6

TABLE LXXXXII

DISTRIBUTION OF 8TH GRADE PUPILS ACCORDING TO THE NUMBER OF DIVISION PROBLEMS SOLVED CORRECTLY—COURTIS TESTS.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Number Pupils	Median
	B				2	1	0	2	4	2	2	3	5	9	1	0	1											32	11.0
	H						1	7	4	6	4	3	1	4	2	0	1											33	8.8
	O					2	6	2	11	4	2	2	2	1	1	1												34	7.6
8A	M				2	2	2	3	1	5	4	4	4	2	2	1	1	0	0	1								34	9.5
	S	1	0	0	1	0	4	4	5	4	3	3	0	1	1													27	7.7
	G			1	2	2	2	6	6	9	1	2	0	2	1													35	7.8
	W		1	0	0	1	0	2	5	3	6	4	6	7	2	1	0	2										40	10.5
	I						8	3	3	4	5	3	2	6	3	2	1											35	9.9
	D			1	1	3	3	3	5	6	1	4	2	3	1	1	0	0	0	0	1							35	8.3
	Total	1	1	2	8	11	21	32	44	43	28	28	22	35	14	6	5	2	0	1	1							305	7.9

DIVISION COURTIS TEST

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Number Pupils	Median
	O		1	1	4	3	8	3	4	6	1	1	0	1	1													29	6.8
	W	1	1	3	1	1	8	4	4	6	2	0	1	0	1													28	7.0
	S			1	5	3	6	3	3	4	1	0	2	1														29	5.4
8B	H	1	1	1	1	0	6	3	8	4	4	3	1	2	1	1	1	1										39	7.8
	M		1	1	1	3	1	5	5	7	1	6	0	2														33	7.9
	C		1	0	0	2	1	2	6	3	4	5	3	1	0	0	1											29	8.8
	R		1	2	6	2	3	5	2	3	0	1	1	1														27	5.8
	B				2	3	4	2	6	5	4	2	4	2	0	0	0	0	0	0	0	1						35	8.1
	I				3	3	1	10	5	3	1	4	3	2	1	1	1											38	7.4
	Total	2	6	9	23	20	28	37	43	41	18	22	15	12	4	2	3	1	0	0	0	1						287	7.2

It will be noted that there is a great difference in the results in addition in different classes of the same grade in the Paterson system. One eighth grade A class has a median in addition of 5.8 problems, while another eighth grade A class has a median in addition of 9.5 problems. The other seven classes of the eighth grade have medians between the two classes quoted. This shows that there is no standard in addition which an eighth grade class in Paterson is expected to reach. There is much variability within the grade, as in School G one child fails to do a single problem correctly, while another child in the same class does nineteen correctly. This same wide range of difference in the number of problems in addition solved correctly will be noted in the different eighth grades. The same is true of subtraction, of multiplication, of division. (1) There is no uniform standard as to accuracy and speed which all eighth grade pupils reach; (2) Children in the eighth grade vary as widely in ability to add, subtract, multiply, and divide as do the children of the grades from third through eighth,—in other words, in the eighth grade there are children of third, fourth, fifth, sixth, and seventh grade ability to add, subtract, multiply, and divide. This was found to be true in regard to the difficulty of the problems which children can solve in these fundamentals as was shown in the results of the Woody test.

It is apparent from the Courtis tables that all the children do not need drill on the same processes, nor do all children need the same amount of drill. Each child should have drill on the process and on the particular phase of that process in which he needs it. He should know when he has reached the standard for that phase in accuracy and speed and then stop the drill. Plans for such drilling are given in the Courtis Drill Lessons published by the World Book Company, Yonkers, N. Y., also the Studebaker Drill Lessons, published by Scott, Foresman and Company.

3.*Stone Tests*

The third type of arithmetic test used was the Stone test. It was used to measure the reasoning ability of the children. The test consists of twelve problems in which it is necessary for one to select the operations as well as perform these operations to obtain the result. Errors either in choice or in performing the operations will cause one to obtain an incorrect answer. The test is as follows:

STONE TESTS IN ARITHMETIC

Solve as many of the following problems as you have time for in the next fifteen minutes. Work them in order as numbered. Use pencil and a sheet of scratch paper.

Write answer here

1. If you buy 2 tablets at 7 cents each and a book for 65 cents, how much change should you receive from a two-dollar bill? ....

2. John sold 4 Saturday Evening Posts at 5 cents each. He kept ½ the money and with the other ½ he bought Sunday papers at 2 cents each. How many did he buy? ....

3. If James had 4 times as much money as George, he would have $16. How much money has George? ....

4. How many pencils can you buy for 50 cents at the rate of 2 for 5 cents? ....

5. The uniforms for a baseball nine cost $2.50 each. The shoes cost $2 a pair What was the total cost of uniforms and shoes for the nine? ....

6. In the schools of a certain city there are 2,200 pupils; ½ are in the primary grades, ¼ in the grammar grades, ⅛ in the high school and the rest in the night school. How many pupils are there in the night school? ....

7. If 3½ tons of coal cost $21, what will 5½ tons cost? ....

8. A news dealer bought some magazines for $1. He sold them for $1.20, gaining 5 cents on each magazine. How many magazines were there? ....

9. A girl spent ⅛ of her money for car fare, and three times as much for clothes. Half of what she had left was 80 cents. How much money did she have at first? ....

10. Two girls receive $2.10 for making button-holes. One makes 42, the other 28. How shall they divide the money? ....

11. Mr. Brown paid one-third of the cost of the building; Mr. Johnson paid ½ the cost. Mr. Johnson received $500 more annual rent than Mr. Brown. How much did each receive? ....

12. A freight train left Albany for New York at 6 o'clock. An express left on the same track at 8 o'clock. It went at the rate of 40 miles an hour. At what time of day will it overtake the freight train if the freight train stops after it has gone 56 miles? ....

The problems at the end of the test are more difficult than those at the beginning of the test. In scoring the papers, twice as much credit is given for solving one of the last five problems as is given for solving one of the first seven—each of the first seven problems is given one credit, while problems 8, 9, 10, 11, and 12 are allowed two credits each if solved correctly. This test was given to a large number of sixth and eighth grade classes in Paterson. The directions for giving the test are as follows:

"The papers will be passed to you with the printed side downward. Please leave them so until I tell you to turn them over. Remember, do not move the papers or look at the printed side."

Pass the papers with the printed side down and the top end away from the pupil. Have the pupils record at the upper right-hand corner of the backs of the sheets their full names, ages at last birthday, grade, and school in the usual way. Show the card which lists the items for which you ask. When these facts have been recorded, make the statement which follows for the test to be given:

"In solving the problems on the other side you may use pencils and an extra sheet of paper if you desire. You are to write the answers on the sheet at the right end of the printed problems. Is anybody not ready? Turn your papers and begin." (Examiners should use care to see that no pupil copies the answers from another pupil's paper).

Fifteen minutes were allowed all pupils for this test. The distribution for the sixth and eighth grades in Paterson. showing how many pupils in each class earned each possible number of credits, is given in Tables LXXXXIII and LXXXXIV.

TABLE LXXXXIII

DISTRIBUTION OF SCORES IN STONE REASONING TEST IN 6TH GRADE

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Number in class	Median
6B	G	2	6	7	8	6	6	4	2	1										42	2.75
	B	2	2	6	5	4	9	3	2											33	4.38
	S	1	3	6	4	4	7	2	3	2										32	4.50
	O		5	10	9	5	4	1	1	1										36	3.33
	J			4	7	5	4	3	3	2	2	1								31	4.90
	N	1	2	1	6	13	6	2												31	4.42
	D	2	2	3	9	8	11	4	1	1			1							42	4.63
	K	2	2	2	12	8	0	10	1	1										38	4.13
	R		2	4	5	5	6	2	3	1	0	1								29	4.70
	C	1	4	5	7	6	10	4	3	0	1									41	4.58
	Total	11	28	48	72	64	63	35	19	9	3	2	1							355	4.29

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Number in class	Median
6A	S		1	6	3	8	4	7	2	1	1	0	0	0	1					31	5.3
	O		2	2	5	10	8	5	1											33	4.8
	H			1	2	4	8	5	7	7	2									36	6.6
	C			6	5	7	5	8	7	3	3	1	2							47	6.1
	E		3	4	3	3	7	4	4	1										29	5.3
	M		1	2	4	6	11	6	9	5	0	0	1	2						47	6
	X		2	3	6	8	3	4	4	3	2									35	4.6
	W		1	3	2	8	6	4	5	3	2	1	1							36	5.7
	Total		10	27	32	49	52	43	39	23	10	2	4	2	1					294	5.6

TABLE LXXXXIV

DISTRIBUTION OF SCORES IN STONE REASONING TEST IN 8TH GRADE

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Number in class	Median
8B	M			1	0	1	5	3	2	4	6	6	2	2	0	1				33	9.1
	S		1	0	1	0	2	7	5	1	2	3	2	2	2	1				29	7.7
	H					2	3	4	5	8	2	3	2	2	4	1	1	1	1	39	8.4
	B		1	0	0	3	6	3	4	3	2	5	3	1	1	0	0	1		33	7.9
	O		1	1	2	2	6	6	4	3	1	3								29	6.4
	C					2	3	3	5	3	5	1	4	0	3					29	8.5
	I			2	0	1	1	5	3	9	3	4	4	0	3	0	1			36	8.7
	W					1	3	5	8	3	2	2	2	2						28	7.6
	R				1	4	4	3	5	4	4	2	1							28	7.4
	Total		3	4	4	16	33	39	41	38	27	29	20	9	13	3	2	2	1	284	8.0

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Number in class	Median
8A	O		1	2	1	4	5	5	5	2	4	0	1	2	1					33	6.7
	H						3	0	3	6	3	3	6	3	4	2				33	10.5
	S						2	2	3	5	1	2	3	2	3	0	3	0	1	27	10.25
	M					1	1	3	3	5	3	1	6	1	4	1	2	1	1	33	10.5
	I						4	4	5	4	4	2	4	0	3	3	2	0	1	36	9.25
	G			2	1	1	9	5	6	1	7	1	0	0	2	0	1			36	7.00
	B				1	0	3	1	4	4	2	3	2	4	4	3	1			32	10.33
	D				1	0	1	3	9	1	6	0	5	0	6	0	2	0	1	35	9.42
	W					2	6	3	5	3	8	3	3	3	2	2				40	9.13
	Total		1	4	4	8	34	26	43	31	38	15	30	15	29	11	11	1	4	305	9.04

The wide variation in the ability to reason of the children of any sixth or eighth grade class is very noticeable. In a 6A class in School S one child solved but one problem correctly in the same time that another child solved ten correctly, while the other twenty-nine children in the class solved various numbers from one to ten. The same condition is more or less true of every sixth and eighth grade class. The variations in the medians of the various sixth grade classes are also great. One class in School X has a median of 4.6 credits, while another sixth grade class in School H has a median of 6.6, two credits more. The other sixth grades vary between these two. It will also be noted that it is not necessarily the small class which does the best work—the classes of 47 pupils, the largest sixth grades, have second and third highest scores. The same conditions are found in the eighth grade classes. The medians vary from 6.4 to 10.5 credits. Compare sixth and eighth grades in regard to the number of credits received. You will note that many sixth grade children are beyond the median of the eighth grade.

The median results of the sixth and eighth grades may be compared with the median results of the same grades which have been obtained in exactly the same manner elsewhere.

TABLE LXXXXV.

Results of the Stone Tests in Five School Systems.

School System	Grade 6	Grade 8
Paterson	5.6	8.5
Nassau County	4.5	7.2
Butte, Montana	4.4	8.2
Salt Lake City	6.9	11.0
Lead, S. Dak.	6.7	11.9

It will be noted in comparing the medians in the above table that the sixth grade in Paterson is better in reasoning ability, as evidenced by the results of the Stone test, than the sixth grade of Nassau County or Butte, Montana, but falls below Salt Lake City and Lead. The same is true of the eighth grade, only that the difference between the eighth grade in Paterson and the eighth grade in Salt Lake City and Lead is very much greater than that of the sixth grade.

CONCLUSIONS

1. The work in the four fundamental processes is not up to standard. It is best in multiplication and poorest in subtraction and division.

2. The results in reasoning are only fair.

3. The classes are poorly graded in regard to the difficulty of problems in the fundamental operations which children can do, in regard to accuracy and speed, and in regard to reasoning ability.

RECOMMENDATIONS

The situation as it exists in Paterson at the present time can be improved.

1. By regrading the children where there are two or more classes of each grade in a school building so that those children who are able to do the work in less time may be in the same class. This would enable the teacher to work them to the level of their ability and better habits of work would be formed. This same arrangement would work to the advantage of the slower children for the way of presenting the work could be planned to suit their slower thinking.

2. Each child should have drill on the process in which he needs it. Plans have been suggested.

3. The ability to think or reason can be improved by (a) eliminating unessentials from the course of study in arithmetic; (b) by presenting the subject-matter in a real situation that it may gain meaning for the child and that he may have a real problem to work out in which the answer counts in a vital way.

4. Good constructive supervision to demonstrate to a body of willing teachers how to do the work understandingly will save time and energy while producing better results.

READING

The reading ability of the children in grades 4B to 4A inclusive was measured by the Thorndike* improved scale for measuring ability in reading. Fifty-eight different classes numbering nearly 2,000 children in all were tested.

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*Teachers College Record No. 1, 1916.

THE TESTS

The Thorndike Scale Alpha 2 is designed to measure the understanding of sentences read silently. A number of paragraphs of graded difficulty are presented. Several questions follow each paragraph and pupils are required to answer these questions in writing. Dr. Thorndike determined the value on the degree of difficulty of each division of the scale by a careful evaluation of the results obtained from testing about 3,000 children. The value thus assigned is considered the standard value. When pupils are rated as having a certain ability in reading it means that they can read up to a certain "difficulty" with only 20 per cent. of errors. A study of results in other cities where this scale has been used tends to show that the standards are reasonable.

The papers were scored in accordance with the key* furnished by Dr. Thorndike. Table LXXXXVI shows the score obtained by the pupils in Paterson compared with the standard score and also with that of the corresponding grades in St. Paul, Minn., Nassau County, N. Y., and the Horace Mann School, New York City.

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*Teachers College Record No. 5, 1915.

TABLE LXXXXVI

READING ALPHA 2

SCORES MADE BY ROOMS TESTED IN PATERSON. ST. PAUL AND OTHER SCORES AND THORNDIKE STANDARDS.

School	4B	4A	5B	5A	6B	6A	7B	7A	8B	8A
B		4.70	5.04	5.18	6.22		6.46		7.01	
O	4.48			5.42			6.30	6.67		6.51
U		4.47								
C	4.56			5.50	6.50	6.91			7.02	
I			5.38				7.15			7.35
V		5.63								
D								6.61		
D								6.86	6 91	6.98
P	5.04									
E		4.66	5.12			6.13				
Q						6.41				
W				5.72						
R	4.22		5.53		5.84	6.13		6.86	6.79	6.72
X		5.18					6.38			
Y				5.10						
A	3.71		4.64							
G					6.15				6.47	
M						6.25		6.49		6.82
S	5.43	5.30	4.94	5.28	6.45		6.60			
H						6.23		6.00	6.67	6.33
Paterson	4.74	4.83	5.12	5.44	6.11	6.37	6.51	6.57	6.82	6.85
St. Paul		5.57		5.72		6.71		7.17		7.75
Nassau Co.				5.7				6.6		
Horace Mann		5.61		6.4		6.85		8.0		7.67
Thorndike		5.25		5.75		6.50		7.00		7.50
Difference between Paterson and Thorndike		—42		—31		—13		—43		—65

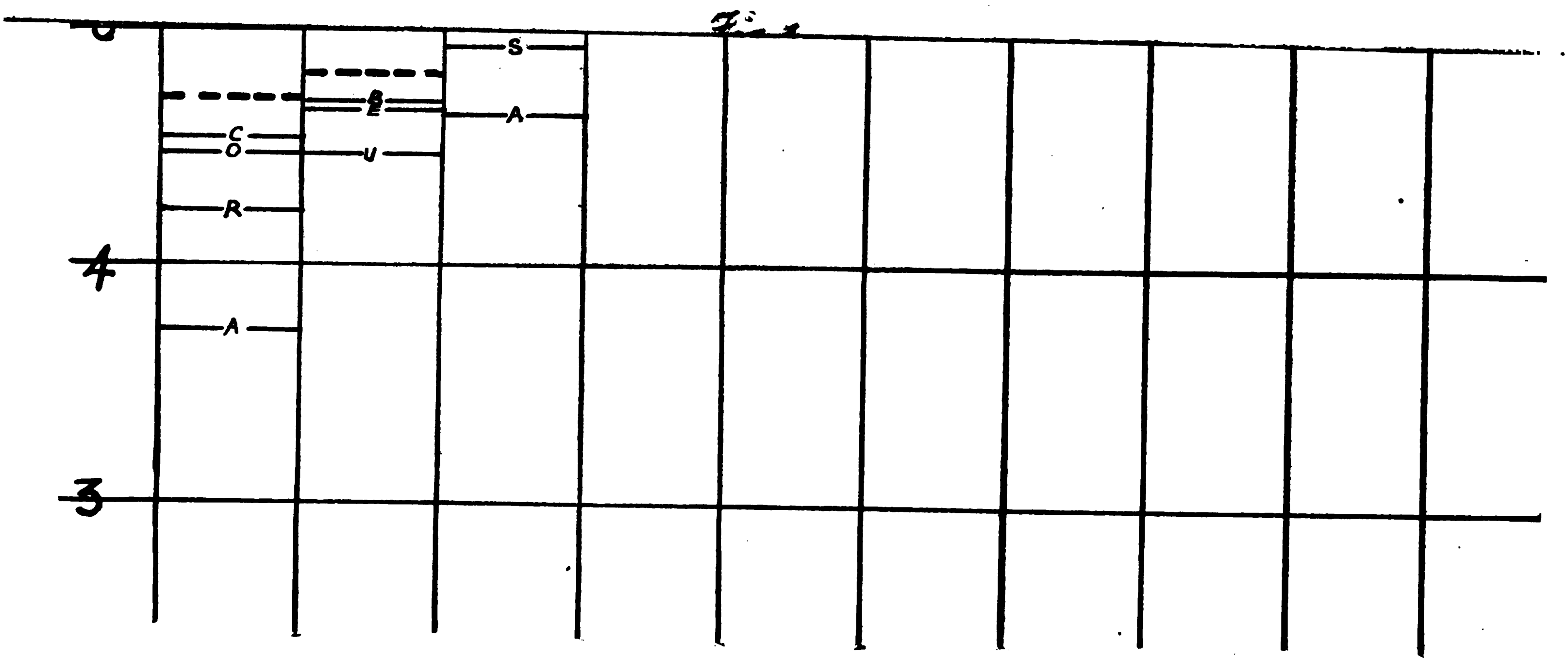
Fig. 1
S
A
B
E
U
C
O
R
4
A
3

It will be noted that the Paterson score falls below the Thorndike standard by the following amounts: 4A -.42; 5A -.31; 6A -.13; 7A -.43 8A -.65. Table LXXXXVI also shows what a slight superiority 8A pupils have over 6A pupils in Paterson. The difference in favor of the former is only .47, while according to the scale, there should be a gain of one whole point, and in St. Paul the 8A pupils surpass the 6A by more than one point or 1.04. Excellent progress seems to have been made in Paterson between Grades 4A and 6A, the difference between the scores being 1.54. This compares very favorably with other cities. Why should not this improvement in reading continue from Grade 6A on?

Ability in reading varies greatly in different schools in Paterson, as the following figures show:

	Grade 4B	5B	8A
Lowest school	A-3.71	School A-4.64	School H-6.32
Highest school	H-5.43	School R-5.53	School I -7.35

The indication is that there is a difference in reading ability between the same grades in different schools which is as great as the difference between 4A and 6A according to the standard scale, or a span of two years of school work.

That there is often great variability in the measures of progress within the same school may be seen in Table LXXXXVII. Progress, after all, is what should be measured in a school system rather than attainment alone.

TABLE LXXXXVII

School H	School C	School I	School R
4B—5.43 8A—6.32	4B—4.56 8B—7.02	5B—5.38 8A—7.35	4B—4.22 8A—6.72
Gain in 4½yr.-.89	Gain in 4yr.-2.46	Gain in 3½yr.-1.97	Gain in 4½yr.-2.50

Is there sufficient difference between the school populations here presented to account entirely for such great variability in the matter of improvement in reading? For example, School H has the highest score for 4B of any school in Paterson. Why should it have the lowest standing of all for its 8A classes?

It is well understood that in any acquired skill such as reading, the progress will always be more rapid in the early years of training than in later years. This question is discussed in the Sixteenth Year Book, Part 1, of the National Society for the Study of Education, Chapter II.

But there should be steady improvement throughout the elementary course though at a slower rate. It would seem that in Grades 6A to 8B, inclusive, the rate of progress is considerably below normal in the art of reading silently and interpreting the thought.

An examination of the paragraphs which form the basis of this scale, together with the questions relating to the selections, will show that they are not more difficult than the text-books, reference books, and literature assigned to the corresponding grades. Dr. Thorndike says of the scale, "The calculations give the degree of difficulty that the class can read with 80 per cent. of correct answers. This can hardly be taken as an adequate reading for purposes of acquiring knowledge or enjoyment." Pupils who fall much below the standards indicated cannot make the progress they should in their other subjects for intelligent reading is essential in all intellectual work. Some difficult texts are being used in the Paterson schools. Can the pupils read and interpret them readily and accurately?

Possibly a greater use of objective standards would change somewhat the teachers' reports regarding pupils who are satisfactory and unsatisfactory in reading. The following items taken from the Superintendent's report for June, 1916, would indicate that the findings of the survey or the teachers must be wrong in their estimate of the children's reading ability, as the percentage rated as unsatisfactory is very small as compared with the results of the tests.

4A	2 per cent
5A	1—3-5 per cent
6A	1 per cent
7A	½ per cent
8A	1 pupil out of 614.

THE CURRICULUM IN READING

The committee resorted to a questionnaire sent to each teacher in the elementary schools to secure the facts regarding the character and scope of the subject-matter, as well as the time allotment. The following is a copy of the questionnaire:

READING QUESTIONNAIRE FOR ELEMENTARY TEACHERS

Paterson Survey

1. What books have been read by your class this term?

   (a) Basal texts.

   (b) Supplementary readers.

2. What other types of reading matter have been used in this grade this term?

3. How many minutes per week are devoted to reading in this grade?

   Approximately how much of this time is devoted to oral reading?

Filled by teacher of school ————— Grade ——

Two hundred and seventy-three were filled out and returned. All the returns were used in making tabulations except a very few from special classes. Classrooms in which there were two grades were not used in calculating the time.

Time Allotment for Reading

As regards the time allotment for reading, remarkable variations were found.

TABLE LXXXXVIII

TOTAL TIME ALLOTTED TO READING PER WEEK.

Grades	Sub-Primary	1	2	3	4	5	6	7	8
Lowest No. Min.	200	100	200	150	120	100	75	60	40
Highest No. Min.	800	575	450	425	370	325	400	240	135

TABLE LXXXXIX

TIME ALLOTTED TO ORAL READING PER WEEK*

Grades	Sub-Primary	1	2	3	4	5	6	7	8
Lowest No.Min.	0	65	30	50	50	40	40	30	20
Highest No.Min.	800	450	400	425	300	200	250	190	100

*This is, of course, included in the total time recorded in Table LXXXXVIII

In the matter of total time given to reading and division of time among the various phases of the subject, such vastly different policies cannot all be equally wise and efficient.

TABLE C.

Number of Classes in all Grades in which Teachers have stated that their Time Allotment for Reading is Devoted Entirely to Oral Reading.

In 2 out of 7 Sub-Primary Classes
In 13 out of 36 1st Grade Classes
In 8 out of 39 2nd Grade Classes
In 7 out of 38 3rd Grade Classes
In 3 out of 39 4th Grade Classes
In 6 out of 31 5th Grade Classes
In 10 out of 29 6th Grade Classes
In 5 out of 27 7th Grade Classes
In 4 out of 26 8th Grade Classes

If all of the cases were added in which about 90 per cent. of the total reading time is given to oral reading, it would be seen that silent reading is probably not receiving the attention that it should. The best current practice calls for a good deal of silent reading carefully supervised so that standards of speed, comprehension, and appreciation may be developed in this highly important skill.

The committee can find no justification for devoting 500, 550, or 800 minutes per week to reading in the sub-primary grades; or 480, 525, or 575 minutes in the first grade. These figures are taken from estimates made by six teachers in these grades. It seems very apparent that children five and six years of age have many active interests and needs and that the school cannot be meeting these when such an excessive amount of time is given to the technique of reading. That a very large part of this time goes into pure drill is evident from other portions of the questionnaire and from numerous observations.

According to the reports of teachers, the reading of real literature receives more emphasis in the sixth and seventh grades than elsewhere. The reports on nine eighth grade classes showed an entire absence of great literature except for the mention of a single poem.

The curriculum of the eighth grade seems to need supplementing by modern virile and stirring books. In a few cases the selections might be better graded. The Vicar of Wakefield surely should not be placed in the sixth grade along with Eugene Field's poems and Jackanapes. Swiss Family Robinson seems placed very high when assigned to seventh grade, together with Irving's Essays. And some of Hawthorne's highly imaginative and introspective stories, such as A Vision of the Fountain, seem quite over the heads of seventh grade pupils from homes where English is imperfectly spoken.

Question two: "What other types of reading matter have been used in this grade this term," was asked in order to ascertain to what extent current topics, newspapers, magazines, and pamphlets on present day problems were being used. In spite of the fact that there were many evidences that pupils were deeply interested in such problems, the reading matter along this line seems rather scant. Table CI shows the use made of this sort of material.

TABLE CI

RECORD OF SUPPLEMENTARY ACTIVITY IN READING

Grades	Classrooms using Current Events	Newspapers and Clippings	Magazines	Pamphlets on Food, W. S. S., etc.
1	0	0	0	0
2	0	0	0	0
3	0	1	0	0
4	1	2	0	1
5	2	4	1	3
6	10	6	2	4
7	10	6	4	3
8	20	10	4	3

One grade reported the use of War Posters.

THE USE OF BOOKS FROM THE PUBLIC LIBRARY

Grades	3	4	5	6	7	8
Classes reported as having	1	0	0	2	2	0

SCHOOL AND CLASS LIBRARY

Grades	2	3	4	5	6	7	8
Classes reported as having and using	1	2	2	0	1	1	0

SUBJECT MATTER

All of the observers who assisted in the survey of reading in the grades were impressed with the fact that reading matter of rather a high quality was in somewhat general use. It is quite evident that thought has been given to the matter of selecting good books and that there has been a considerable enrichment of the curriculum through the introduction of literary wholes. In every school visited several classes were observed reading some of the choicest classics for children. The fact that good taste and judgment have been used in this regard is shown also by the data furnished in the questionnaire.

Such titles as the following occur a number of times in the reports for grades four to eight, inclusive:

Pinocchio
Water Babies
Seven Little Sisters
The Dutch Twins
Alice in Wonderland
The Blue Bird
The King of the Golden River
Viking Tales
Hans Andersen's Stories
Black Beauty
Robinson Crusoe
The Little Lame Prince
Docas, the Indian Boy
Moni
Heidi
Hawthorne's Wonder Book
Tanglewood Tales
Stockton's Fanciful Tales
Siegfried
Jackanapes
Vicar of Wakefield
Gulliver's Travels
Irving's Sketch Book
The Dog of Flanders
The Nuremburg Stove
Hiawatha
Swiss Family Robinson
Little Women
Little Men
The Man Without a Country
Julius Caesar
Courtship of Miles Standish
Snow Bound
Uncle Tom's Cabin
Tom Brown's School Days

THE QUALITY OF TEACHING READING

Visits to all grades from sub-primary to eighth grade in four schools were made in order to judge of the quality of teaching reading. The schools were selected as typical of the various school populations of Paterson. Sixty-eight recitations were observed and in most cases the same rooms were visited by two judges on different days. These visitors were asked to express an opinion on the points indicated in the following outline:

OUTLINE FOR SURVEY OF TEACHING OF READING

I. Subject Matter
  1. Prescribed
    Selected by pupils
      a. Of interest to class
      b. Adapted to grade
      c. Of literary value
      d. On current topics

II. Method
  1. What specific purposes of pupils are apparent?
    What is the teacher's purpose?
    Are these purposes realized?
  2. If the reading is oral, is the spirit and purpose social?
  3. Do pupils read thoughtfully?
    Do they display understanding and appreciation?
    Are thought-provoking questions asked?
      By pupils? By teacher?
  4. Are pupils independent in their reading?
    Does the teacher give effective help in mechanics?
  Is continuity sacrificed to drill?
  5. Amount read by pupils
    Is selection divided into thought units?
  6. How much time given to silent reading?
    Any indication of silent reading at another time in the day?
  7. Assignment
    By pages or chapters
    By purposes and ideas

It would not be profitable to attempt to give an estimate on all of these phases of the work. Only the most significant points will be discussed.

The subject matter has already been treated of, but it is in place here to state that out of the 68 lessons observed, current events was the subject in only one. That was in an eighth grade class, and the recitation was rated as one of the best seen. The children were active participants. This was the only lesson observed in which the pupils had any voice in the selection of what they were reading and it was one of only two recitations in which questions were asked by pupils. The term "current events" is here used to include not merely the periodical of that name, but also newspapers, magazines, etc.

The following tabulation shows the committee's estimate of the intrinsic value of the reading heard. The selections were undoubtedly of higher literary worth than would be found in many school systems. The showing is much lower than it should be as regards provisions for questions of the day.

Of positive literary worth	49
Negative, poor	7
Fair, doubtful	6
Current topics	1
Miscellaneous, historical, geographical	3
Character not indicated	2

Although the material read was so largely literary in character, the effort of many of the teachers was very evidently centered upon securing technically correct oral reading rather than upon mutual group enjoyment and appreciation. There were notable exceptions to this general condition, and in a few cases some very skillful work was done in interpreting and opening up fuller meanings of the story or poem. In a few cases the sympathetic and painstaking attempts of the teachers toward this end failed because the selection was poorly adapted to the grade, but these teachers at least showed that they were keenly aware of one of the chief purposes of reading. In sharp contrast to this point of view were two or three lessons in which so fine a classic as Alice in Wonderland was literally dissected for purposes of teaching grammar, almost the only questions put being toward identifying parts of speech. The chapter read was one of the most delightfully humorous in the book, but not a word was said about it by either teacher or pupils and not once did anyone laugh. Would not a certain remark of the Duchess in "Alice" be appropriate for consideration here? "Take care of the sense and the sounds will take care of themselves."

In nearly half of the lessons observed the teachers interrupted the continuity of thought either to drill in enunciation, or to ask questions in grammar, or to get definitions of words. Since there are large numbers of children in the Paterson schools from non-English speaking homes, the effort to train in enunciation and pronounciation is to be highly commended. It should be said, further, that good results along these lines are manifest. The question is as to the best time and place for this drill.

The fact that questions were asked by pupils in only two rooms and that spontaneous remarks were made in only two other rooms, shows that much remains to be accomplished in the matter of a genuinely social organization of the oral reading. That some attention has been given this question by certain teachers was shown by the position which pupils took in their classes when reading. In a number of cases it seemed to be understood that the reader would come to the front of the room and plainly address himself to the group. The great lack was in the entire absence of choice on the part of pupils, the neglect of discussion and comment by them, and the repression (consciously or unconsciously) of all spontaneous manifestations of pleasure in the activity.

The method of teaching beginning reading in sub-primary and first grades seems to be a combination of several popular methods. A good deal of latitude appears to be accorded the teachers as there is no uniformity in the text-books used. The most general aim seems to be to build up as rapidly as possible a large vocabulary of words and phrases which pupils will recognize at sight and to lay some foundation in phonics. Some of the teachers use a great many devices to keep the children active and responsive during the extensive drill in mechanics. Where the greatest amount of this drill is going on, the content is very thin. An entire term is often spent in sub-primary classes on word drill, phonics and the meagre ideas furnished by a single primer. The surveyors feel that much more time should be given in the lower grades to language work of a high order with a consequent reduction in mechanical, routine drill. The amount of drill in some sub-primary classes, and the failure to provide for the children's natural, wholesome, and highly valuable interests and aptitudes, must be stultifying. If reading must be begun at such an early age, a variety of the most attractive nursery picture books should be furnished, together with several of the best primers. In addition to this, play life and the most significant environmental experiences within reach should be used as a basis for part of the vocabulary work.

RECOMMENDATIONS

1. Try to discover the influence at work resulting in the high scores obtained by certain classes, and if these are subject to control, make greater conscious use of them in other classes.

2. Take some of the pressure off the sub-primary and first grades, enrich the course there, and hold the intermediate and upper grades for greater improvement in reading ability.

3. Make a statistical study of the time spent on reading by a class in its progress from sub-primary to second grade. The committee believes that a very high price is being paid for the results obtained.

4. Give more time to silent reading together with

more real training of pupils in that type of reading ability.

5. Make the methods of teaching suit the high quality of literary selections frequently found in the Paterson schools. Do not allow drill to intrude in this sort of material.

6. Provide more reading matter of a type to appeal to that considerable group of boys and girls found everywhere who are not literary in their tastes. In particular, make greater use of newspapers, magazines, and other printed matter on questions of the day.

7. Provide for a more truly social exchange of ideas, for the exercise of individual and group tastes and choice, and for pupil criticism and questions. At present the teachers appear to make practically all criticisms and to ask all questions. Therefore the teachers are doing most of the thinking and organizing.

8. Unless the teachers reporting through the questionnaire failed to mention the matter through oversight, there should be a much closer cooperation between the schools and the public library.

9. On the whole, the grading of selections is probably about right for Paterson, but a committee of teachers representing grades three to eight could improve the grading of certain selections and books.

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3.................Book Lists.

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The Forum of Democracy. Watkins and Williams, Allyn and Bacon, 1917. While better suited, as a whole, for high school, there are a number of fine selections which could be used in seventh and eighth grades. The book consists of extracts from articles and addresses by Wilson, Roosevelt, Poincare, Grey, Lloyd George, and other prominent men.

American Patriotic Prose and Verse. Edited by Stevens, McClurg, 1917.

TESTING INSTRUCTION BY THE USE OF THE TRABUE LANGUAGE SCALES

Language is perhaps the most important of the social arts. By means of it the major portion of the work of the school is carried on. A test which measures the progress of pupils in the mastery of the art of language reveals some of the most significant facts with which elementary education is concerned.

To secure additional and more general information than was afforded by the reading and composition tests, the children in grades two to eight, inclusive, were tested by means of the Trabue Language Scales, consisting of mutilated sentences in which the missing words were to be supplied.

The ability to complete sentences of the type mentioned represents a combination of native capacity and training which is highly indicative of the presence of the ability to perform numerous other functions of importance in school work. For this reason the language scales are a valuable supplement to the tests for more specific ability.

Each of the scales used is of approximately the same difficulty as determined by the average error of a large number of children in the different grades of the school who took the tests.

Scale B , one of the scales used in the Paterson survey, which appears below, shows the general nature of the Completion Test.

TRABUE LANGUAGE SCALE B

1. We like good boys .... girls.
6. The .... is barking at the cat.
8. The stars and the .... will shine tonight.
22. Time .... often more valuable .... money.
23. The poor baby .... as if it were .... sick.
31. She .... if she will.
35. Brothers and sisters .... always .... to help .... other and should .... quarrel.
38. ....weather usually .... a good effect ....one's spirits.
48. It is very annoying to .... tooth-ache, ... often comes at the most .... time imaginable.
54. To .... friends is always .... the .... it takes.

The sentences of each scale are graduated in difficulty, the first sentence being so easy that all may reasonably be expected to complete it, and the last requiring a degree of ability which elementary pupils rarely exhibit.

For each sentence perfectly completed by the child a score of two points is given and a score of one point for each sentence which, although imperfect, completes a thought.

Since the scoring of the results is simplified by the use of a key, and the score which any school grade should approximate is definitely known, it is possible to draw certain useful conclusions from a comparison of the findings in one school system with those of another.

In giving the tests the examiners followed uniform directions which are given below:

COMPLETION TEST, LANGUAGE SCALES

The elementary language scales (B, C, D, or E) are to be given from the second grade through the eighth grade. The elementary language scales will not be given in those elementary schools in which reading scale Alpha is given. Examiners may give B or C Scales in the morning and D or E Scales in the afternoon. The language scale (L or M) is to be given to all high school pupils. The actual working time allowed pupils on an elementary language scale is seven minutes, on a secondary language scale five minutes.

When giving an elementary language scale to a second grade class, distribute first of all a Practice Sheet to each pupil, and explain that one word should be written on each blank so that each sentence will make good sense. Give individual attention to pupils in this practice test in order that no pupil may fail because of a misunderstanding of what is expected. The examiner may even write the proper word in the blank for any child who does not readily grasp the idea. As soon as a child has finished the Practice Sheet have him turn it over, sign his name, his age at last birthday, his school grade. and the name of the school. Collect the Practice Sheets before distributing the test papers.

After each child in the second grade understands the Practice Sheet, or imediately upon entering the room of a higher grade, the examiner should pass the test sheets to the pupils with theprinted side downward. Ask the pupils not to turn the papers over or look at the printed side until they are told to do so. Have each child write his name, his age at last birthday, his school grade, and the name of the school at the upper right-hand corner of the back of the sheet. The examiner may place at the front of the room the card showing the four items for which he asks.

When the information required has been properly entered on the back of the sheet, hold up a test paper before the class and explain as follows: "This sheet contains sentences that are not quite complete. There are some blank spaces in each sentence. You are to write one word on each blank, in each case selecting the word which makes the best sense. You will have seven minutes (or five minutes H. S.) to complete these sentences. Are there any questions?"

Answer briefly any questions, then continue:

"Remember that you are to write only one word on each blank. If you are all ready you may now turn your papers and go to work."

After the test has begun, any child who asks a question is to be told quietly to do what he thinks best about it. Be very careful to allow exactly seven minutes for an elementary language scale, and exactly five minutes for a secondary scale. The Test Record Sheet for each room should be filled out by the teacher and the examiner, and bound up with the package of test papers for that room.

TABLE CII.

DISTRIBUTION OF SCORES ON COMPLETION TEST LANGUAGE SCALES B, C, D, OR E.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total Papers	Median
2B	Y	2	0	6	0	15	2	3	1	2	0	1											32	4.53
	S	0	0	15	0	10	1	8	0	0	0	0											34	4.2
	T	8	0	14	0	10	0	0	0	0	0	0											32	2.57
	B	8	1	9	3	3	2	3	2	1	0	0											32	2.8
	I	5	2	7	0	4	0	1	0	0	0	0											19	2.4
	K	10	0	18	1	4	0	2	0	1	0	0											36	2.4
	X	1	1	15	1	1	0	1	0	0	0	0											20	2.53
Total		34	4	84	5	47	5	18	3	4	0	1											205	2.8

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total Papers	Median
2A	H	0	0	7	0	7	0	11	2	3	0												30	6.09
	K	0	0	8	1	8	3	7	2	2	1												32	4.87
	D	4	0	5	1	11	2	12	1	5	2												43	5.25
	A	1	1	4	0	11	1	8	1	0	0												27	4.68
	W	1	0	4	0	11	0	15	2	3	1												37	6.16
	G	2	1	9	1	6	4	7	2	2	0												34	4.66
	O	2	0	6	0	14	1	7	0	6	0												36	4.57
Total		10	2	43	3	68	11	67	10	21	4												239	4.9

TABLE CII—(Continued)

DISTRIBUTION OF SCORES ON COMPLETION TEST LANGUAGE SCALES B, C, D, OR E.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total Papers	Median
3B	J	0	0	0	0	0	4	9	1	7	1	6	0	2									30	8.14
	M	2	0	6	3	5	3	5	5	2	1	3	0	0									35	5.49
	B	0	0	3	2	1	6	5	2	6	3	5	0	0									33	6.9
	H	1	0	4	0	7	1	9	4	5	1	1	1	0									34	6.44
	C	4	0	3	0	8	1	16	2	1	0	1	0	0									36	6.12
	L	5	1	0	7	3	3	4	0	1	0	0	0	0									24	3.84
Total		12	1	16	12	24	18	48	14	22	6	16	1	2									192	6.3

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total Papers	Median
3A	V	0	0	0	0	1	3	0	2	5	8	7	0	2	1								29	9.4
	H	2	1	3	2	0	3	6	5	5	3	2	2	0	0								34	7.0
	O	0	0	0	1	5	3	6	8	3	6	2	2	1	0								37	.4
	G	1	0	2	1	2	6	5	4	7	1	5	3	2	0								39	7.6
	K	1	1	3	1	2	6	2	3	5	3	8	1	1	1								38	8.0
	R	0	0	1	0	5	2	9	0	6	2	4	2	1	0								32	6.9
Total		4	2	9	5	15	23	28	22	31	23	28	10	7	2								209	7.8

TABLE CII—(Continued)

DISTRIBUTION OF SCORES ON COMPLETION TEST LANGUAGE SCALES B, C, D, OR E.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total Papers	Median
4B	M	0	1	0	2	1	0	4	5	12	3	5	1	3	1								38	8.5
	T	1	0	1	0	6	5	5	3	7	2	4	2	6	0								42	8.0
	B	0	0	0	1	4	1	6	1	6	5	4	1	1	0								30	8.3
	U	0	0	4	0	7	0	3	2	6	2	4	1	2	2								33	8.1
	J	0	0	0	0	2	0	8	4	11	5	7	0	2	2								41	8.6
	W	0	0	1	0	1	2	10	0	8	1	5	0	2	1								31	8.0
Total		1	1	6	3	21	8	36	15	50	18	29	5	16	6								215	8.3

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total Papers	Median
4A	H	0	0	0	0	1	0	4	4	6	3	6	6	6	1	0	0	0					37	10.1
	L	0	0	0	0	1	1	5	3	7	3	1	2	0	0	0	0	0					23	8.2
	G	1	0	1	0	2	0	13	4	7	1	9	0	1	0	0	0	0					39	7.7
	C	1	0	1	1	2	1	9	1	7	1	4	1	2	0	0	0	1					31	7.5
	P	0	0	1	0	1	0	5	3	7	3	11	2	1	0	3	0	0					38	9.7
Total		2	0	3	1	7	2	36	15	34	11	31	11	10	1	3	0	1					168	8.5

TABLE CII—(Continued)

DISTRIBUTION OF SCORES ON COMPLETION TEST LANGUAGE SCAL ES B, C, D, OR E.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total Papers	Median
5B	Y	0	0	0	0	0	0	2	1	3	3	2	5	3	1	2	1	0					23	11.1
	H	0	0	1	0	0	0	3	1	5	7	7	6	6	2	2	1	0					41	10.5
	C	1	0	0	2	1	3	4	6	5	8	5	3	2	0	1	0	0					41	8.7
	J	0	0	0	0	0	0	1	2	5	8	6	9	4	3	2	0	0					40	10.66
	W	0	0	0	0	1	1	4	3	2	3	13	7	2	2	0	0	1					39	10.42
	M	0	0	0	0	1	0	1	2	3	4	7	4	5	4	0	3	1					35	10.93
Total		1	0	1	2	3	4	15	15	23	33	40	34	22	12	7	5	2					219	10.31

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Pupils	Median
5A	G					0	2	2	1	9	5	5	4	2	1	1	0	0					32	9.4
	R					0	1	1	3	3	1	15	0	7	2	1	0	0					34	10.53
	O					0	2	2	4	3	4	8	4	1	2	0	0	0					30	10.0
	P					1	1	0	0	7	4	9	5	9	1	1	0	1					39	10.72
	H					1	1	2	0	12	3	4	2	8	0	0	0	0					33	9.17
	V					1	0	0	2	6	1	11	2	7	1	3	0	0					34	10.64
Total						3	7	7	10	40	18	52	17	34	7	6	0	1					202	10.31

TABLE CII—(Continued)

DISTRIBUTION OF SCORES ON COMPLETION TEST LANGUAGE SCAL ES B, C, D, OR E.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total Pupils	Median
6B	D				0	0	1	2	3	1	6	6	9	6	3	4	3	0	0				44	11.33
	Q				0	0	0	0	0	3	1	8	3	3	6	2	1	0	1				23	12.5
	U				2	0	0	1	2	5	5	12	3	3	4	0	1	0	0				38	10.33
	M				0	0	0	1	0	5	1	4	5	7	4	0	2	4	1				34	12.14
	E				0	0	0	1	2	1	4	6	10	6	3	0	0	0	0				33	11.25
	H				0	0	0	0	2	2	5	9	9	4	6	1	1	0	0				39	11.16
	M				0	0	0	0	1	5	9	12	3	3	2	0	0	2	0				37	10.29
Total					2	0	1	5	10	22	31	52	42	32	28	7	8	6	2				248	11.02

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total Pupils	Median
6A	G					0	0	0	2	2	4	4	7	9	8	3	0	0	0				39	12.06
	S					0	1	0	0	2	4	1	6	11	8	1	1	0	0				35	12.32
	O					1	0	0	1	2	3	5	3	2	9	2	1	0	0				29	11.83
	I					0	0	0	0	0	1	7	2	12	6	9	2	2	1				42	12.91
Total						1	1	0	3	6	12	17	18	34	31	15	4	2	1				145	12.43

TABLE CII—(Continued)

DISTRIBUTION OF SCORES ON COMPLETION TEST LANGUAGE SCALES B, C, D, OR E.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total Pupils	Median
7B	M					0	0	0	1	1	3	8	6	3	7	3	2	1	0	0	0		35	11.75
	R					0	0	1	0	1	3	9	8	7	5	8	1	0	1	1	0		45	12.07
	W					0	1	1	0	3	0	7	2	6	4	4	2	0	0	2	0		32	12.33
	C					1	0	1	0	3	5	6	6	9	7	1	2	2	0	0	0		43	11.91
	H					0	0	0	0	0	0	10	0	10	5	5	2	1	1	1	1		36	12.80
	O					0	0	2	0	4	4	12	6	4	2	1	0	0	0	0	0		35	10.62
	D					0	0	0	1	2	2	7	2	14	6	3	0	3	0	1	0		41	12.46
Total						1	1	5	2	14	17	59	30	53	36	25	9	7	2	5	1		267	12.09

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total Pupils	Median
7A	G							2	0	3	1	7	5	4	1	4	2	3	0	0	0		32	11.6
	S							0	0	3	0	8	2	3	2	5	1	6	0	3	0		33	13.25
	B							0	0	0	3	1	5	4	4	14	0	0	0	0	0		31	13.62
	C							0	0	3	2	8	5	6	4	5	0	2	0	0	1		36	12.0
	X							0	0	3	0	3	6	7	2	3	1	1	0	0	0		26	12.14
Total								2	0	12	6	27	23	24	13	31	4	12	0	3	1		158	12.37

TABLE CII—(Continued)

DISTRIBUTION OF SCORES ON COMPLETION TEST LANGUAGE SCALES B, C, D, OR E.

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total Pupils	Median
8B	R							1	1	3	3	2	8	3	3	1	5	1	0	0	0		31	11.7
	M							0	0	3	0	3	5	3	6	4	4	2	0	0	0		30	13.1
	H							0	0	1	0	3	2	5	7	4	3	10	5	0	1		41	14.6
	I							0	0	1	0	4	4	4	9	6	5	8	2	0	0		43	13.9
	O							0	0	1	2	2	4	10	2	4	1	1	0	0	0		27	12.5
	W							0	2	3	2	2	3	10	5	0	2	1	0	0	0		30	12.3
Total								1	3	12	7	16	26	35	32	19	20	23	7	0	1		202	13.0

Grade	School	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total Pupils	Median
8A	S								0	0	0	0	2	3	4	4	5	5	4	1	0		28	15.5
	G								0	1	3	6	7	4	7	5	3	0	0	0	1		37	12.4
	B								1	1	2	1	3	11	4	4	3	4	0	0	0		34	12.8
	O								3	3	7	6	1	8	3	3	3	0	1	0	0		38	11.0
	D								0	1	3	6	2	6	1	5	5	1	0	1	0		31	12.6
	W								0	1	3	1	2	3	7	7	5	5	4	0	0		38	14.3
Total									4	7	18	20	17	35	26	28	24	15	9	2	1		206	13.07

The median achievement of pupils in language work in Paterson compared with the results in other school systems and the tentative standard score for each grade determined by the author of the tests are shown in the following tables:

TABLE CIII

MEDIAN ACHIEVEMENT FOR PATERSON AND OTHER SCHOOL SYSTEMS

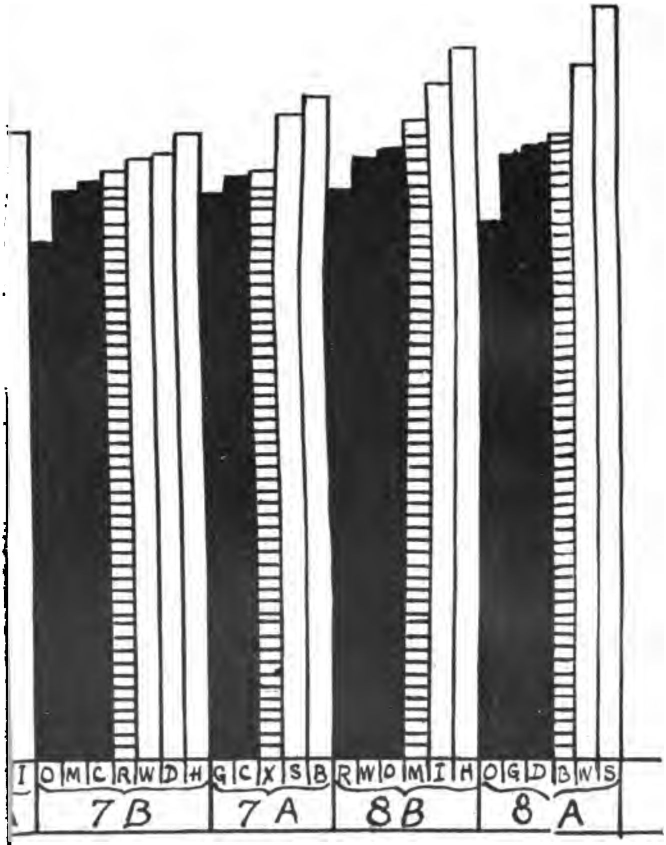
	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Paterson	(B8.3 (A8.5	(B10.3 (A10.3	(B11.02 (A12.43	(B12.09 (A11.37	(B13.0 (A13.07
Nassau County	10.2		12.4		14.0
Mobile, Ala.	11.7		12.7		14.4
Chatham	10.7		12.2		15.7
St. Paul	9.4	11.1	12.2	13.1	14.0

TABLE CIV

MEDIAN ACHIEVEMENT IN PATERSON COMPARED WITH STANDARD MEDIAN.

	Standard	Paterson		
		B		A
Grade 4	8.0	8.3	—	8.5
Grade 5	9.6	10.31	—	10.31
Grade 6	11.0	11.02	—	12.43
Grade 7	12.3	12.09	—	11.37
Grade 8	13.3	13.00	—	13.07

It appears from the foregoing tables that the children in the Paterson schools, with the exception of the seventh grades tested, reach or surpass the average achievement of the school children selected at random th



ath columns
hools.

Each column represents
achievement of one school.

and are below the average of those schools for which accurate records are available.

Taking an extreme example, we see that the median achievement of grade four in Paterson is 8.3, 8.5; in Mobile, Ala., 11.7. A difference in average score of 3.4 more points in a grade in which the standard median achievement is only eight sentences shows a marked superiority in language ability.

It is significant that there are students ranging in grades from 2B to 5B, inclusive, who made zero scores, in all 52 students. More than 6 per cent. of the 3B grade could not complete a single sentence. This group of incompetents forces our attention upon one of the greatest of the unsolved problems in public school administration. A uniform elementary school curriculum consisting mainly of some form of language work which carries pupils into the fifth grade as yet unable to supply the simplest connective in a sentence is evidently subject to criticism. Such pupils should be located and examined by a specialist to determine the reasons for their lack of progress and administrative measures should be taken to the end that these pupils may be taught those useful things which they can learn so that the regular teacher may be permitted to give more time and attention to those who are capable of more rapid growth.

The other facts shown by this test are of interest as they affect the classification problem in Paterson. The first is the variation between the median achievements of the same grades in different schools, which is as much as 4.5 points (or more than two sentences) in the 8A grades tested. In only four of the fourteen grade divisions tested, namely, 2A, 4B, 5A, and 6A, is the difference below two points.

The second fact is the very great variation shown between the achievements of the pupils in any one room. In one 4A grade the difference between the poorest and the best pupil is fifteen, or seven and a half sentences out of a possible ten, and in all grade divisions above the second, rooms can be found where the difference in ability within the room is ten or more points.

Since this test correlates very highly with tests of other abilities it is one of the most useful in showing general ability. The above findings show that children are poorly classified and that the variability within the same grades calls for more adequate supervision.

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